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National Potato Germplasm Evaluation and Enhancement Report, 1985



United States
Department of
Agriculture

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Research
Service

Beltsville Agricultural
Research Center
Beltsville, Maryland

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Fifty-Sixth Annual Report
by Cooperators

Compiled and Edited
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UNITED STATES DEPARTMENT OF AGRICULTURE
BELTSVILLE AGRICULTURAL RESEARCH CENTER (BARC), BELTSVILLE,
MARYLAND, AND CHAPMAN AND AROOSTOOK FARMS, PRESQUE ISLE, MAINE

Raymon E. Webb and Robert W. Goth, BARC, and David Wilson,
Presque Isle, Maine

BARC

Breeding and Evaluation: Two hundred seventy-one crosses were obtained among 71 parental clones and varieties. Emphasis in the crossing program continued on producing high quality, long russets, improved chip quality from extended low-temperature storage among round whites, and improved pest resistance in red-skin types. Resistance to viruses, particularly PVX and Y, to the golden nematode, and Verticillium wilt received much attention in the crossing program.

Thirty-seven thousand two hundred first-year seedling tubers were produced from 91 selected seed progenies. Just over 8,000 seedling tubers from 41 families were sent for planting on Chapman Farm, and the remainder was shared with Colorado, Minnesota, New York, and North Carolina.

Selections from progenies segregating for resistance to PVM, S, X, and Y were screened in the greenhouse during the winter months, and those segregating for resistance to the golden nematode were sent to Dr. W. Brodie, Cornell. Segregation patterns among small populations of specific virus- and golden-nematode resistant progenies were as follows: 77% resistant to PVX; 66% resistant to PVY; 42% resistant to both X and Y; 70% resistant to the golden nematode; and 39% resistant to X, Y, and the golden nematode. Only 48 percent of about 1,400 clones from the general selection program were resistant to the golden nematode. The PVM and PVS tests are still underway.

Twenty selections highly resistant to late blight and some other pathogens selected for horticultural characteristics were pathogen-indexed and increased in the greenhouse for movement to Chapman for seed increase as well as maintenance as breeding stocks.

Presque Isle

Chapman Farm: Approximately 8,000 seedling tubers, mostly russets segregating for resistance to pests and processing quality, were grown for selection purposes. Five hundred eighty-five selections were made for further study. Approximately 1,500 8-hill selections, mostly russets, were grown for horticultural selection, processing quality, and pest resistance studies. Approximately 600 selections were retained. Russet type, tuber conformation, specific gravity, and french-fry quality among this group showed considerable improvement over most past russet selection opportunities. About 48 percent of this group of selections proved resistant to the golden nematode. High resistance to PVX and PVY is also represented among this group of selections. Three hundred six selections, mostly round whites, were retained

from the 40-hill group of advanced clones. Selection criteria emphasis within this group centered on chip processing from long term, low-temperature storage, tuber skin brightness, type, and yield. A number of advanced selections were increased for grower trials. Among the russet group B9540-62 was named NemaRus. B9540-55, B9569-2, and B9596-2 (Table 6) were continued in an evaluation posture. Several round white clones with continued promise for chip processing included B9140-32, B9340-13, B9792-61, and B9792-157 (Tables 2 and 3).

Aroostook Farm: (Weather data, Table 1). Varietal collections and older breeding lines were grown for maintenance and distribution to others. In disease trials, 14 percent of entries in the scab trial appeared as resistant to infection as Superior, Ontario, and Russet Burbank. Eleven entries in the Verticillium wilt-resistant trial responded similarly to Abnaki, the resistant control. Thirteen (28 percent) of 50 entries in the Verticillium test showed varying degrees of susceptibility to pinkeye.

Echo Lake: Seventy-five items were increased for distribution to cooperators for evaluation during the 1986 season. Eleven of the clones were placed with seed growers to increase seed for commercial trials in 1987. Most of these were entered in the Maine Potato Board's meristem culture program.

Yield Trials: Experimental design for all yield trials (Tables 2-8) was a randomized block with four replications of 25 seed pieces each. White tuber trials received 150 pounds NPK per acre, and russet types received 180 pounds per acre banded with a two-row planter. Seed spacing for white tuber trials was 9 inches and for russet trials, 12 inches. All plantings were done by hand.

Cultural methods and materials for weed, insect, and disease control were according to local recommendations. Rainfall and temperature during the season are given in Table 1. At harvest, all entries were graded and samples hand selected for specific gravity and quality evaluations. Specific gravity was determined by the air-water method. Following specific gravity determinations, selected samples were divided and placed at 50° F, 45° F, and 40° F storage at 90 percent relative humidity.

Processing: Samples stored at 50° F were processed into chips and french fries after 2 months of storage. Those stored at 45° F and 40° F were processed after 4 to 4-1/2 months. Out-of-grade items in the 40° F storage samples were reconditioned at 60° F for 2 weeks before processing.

Potato chips were made from each sample by taking 1/16-inch slices from cross- and lengthwise sections of each tuber. Lengthwise chips were used to detect possible increase in reducing sugars, particularly near the stem end. Slices were

rinsed in water and placed on paper towels to remove excess moisture. Chips were then fried at 340° F in Primex vegetable shortening until bubbling ceased.

Long tuber types were processed only into french fries. A 3/8-inch diameter plug was cut from the cross- and lengthwise sections of each tuber, washed, dried, and fried at 360° F for 5 minutes.

Each potato chip and french fry was classified after frying into color classes. Chip classes ranged from 1 = very light to 10 = very dark. French fry classes ranged from 1 = very light to 5 = very dark. Weighted averages were calculated by multiplying the number of chips or fries in each color class by the color class, totaled, and divided by the number of chips or french fries in each sample. Color ratings were made by using the PCII reference color chart 1206-U.

After color classification, each french fry plug was broken open and internal texture classification as 1 = mealy, 2 = intermediate, or 3 = soggy, and a weighted texture index calculated.

Summary

Smaller than normal seedling tuber populations have been grown on Chapman in recent years due, in part, to replacing drainage tile in two fields and maintaining the crop rotation system. This project has been completed and a gradual increase in plantings of segregating tuber progenies is anticipated. Emphasis will continue on developing high quality, long russet tuber types adapted to the major eastern ecological zones, round whites with improved chip capability from long term, low-temperature storage, and adapted red tuber types with improved pest resistance.

BARC Table 1. Weekly average maximum and minimum temperatures and total weekly rainfall, Aroostook Farm, Presque Isle, Maine, 1985.

| Week Ending | Avg. Temperature F | | Rainfall |
|-------------|--------------------|------|----------|
| | Min. | Max. | Inches |
| May 7 | 32.1 | 56.6 | .36 |
| 14 | 35.9 | 59.3 | 2.05 |
| 21 | 42.4 | 67.7 | .70 |
| 28 | 41.4 | 68.7 | .75 |
| June 4 | 46.7 | 76.1 | .34 |
| 11 | 44.9 | 71.6 | 1.07 |
| 18 | 46.4 | 68.1 | .88 |
| 25 | 48.9 | 71.0 | 1.93 |
| July 2 | 50.3 | 76.0 | .30 |
| 9 | 57.1 | 81.6 | 2.59 |
| 16 | 56.4 | 77.4 | 1.69 |
| 23 | 56.4 | 78.3 | .05 |
| 30 | 52.1 | 76.9 | 1.18 |
| Aug. 6 | 51.6 | 78.4 | .81 |
| 13 | 50.9 | 80.3 | .11 |
| 20 | 51.3 | 77.7 | .75 |
| 27 | 50.0 | 70.1 | .13 |
| Sept. 3 | 45.1 | 68.9 | .73 |
| 10 | 49.3 | 66.3 | .60 |
| 17 | 39.3 | 64.1 | .32 |
| 24 | 48.6 | 77.3 | .00 |
| Oct. 1 | 48.3 | 68.9 | 1.81 |
| Total | | | 19.15 |

BARC Table 2. Round white yield trial harvested 110 days after planting, Echo Lake, 1985.

| Pedigree | Mkt CWT/A | % Mkt | Tuber size distribution | | | | | | Tuber Rating ¹ | Spec Grav ² | Chip Color ³ | | | | |
|----------|--------------|----------|-------------------------|--------|--------|------|--------|---|------------------------------|---------------------------|-------------------------|---------------|----------------|---------------|------------------------|
| | | | 1-7/8"-2-1/4" | | | | | | | | >4" | 50°F 2 mos | 45°F direct | 40°F 4 mos | 40°- 60°F 14 das |
| | | | <1-7/8" | 2-1/4" | 3-1/4" | 4" | 3-1/4- | | | | | | | | |
| B8701-10 | 406.6 | 93.6 | 2.8 | 10.2 | 32.1 | 11.2 | 0.9 | 6 | 87 | 5.9 | 7.2 | 6.8 | 6.4 | | |
| B8702-18 | 390.6 | 88.5 | 4.8 | 16.4 | 27.8 | 7.2 | 1.9 | 5 | 77 | 6.2 | 9.0 | 8.2 | 8.1 | | |
| B8710-1 | 374.7 | 89.2 | 5.9 | 19.9 | 25.8 | 3.2 | 0.0 | 5 | 83 | 6.0 | 9.2 | 8.9 | 9.0 | | |
| B9127-6 | 408.1 | 93.9 | 2.6 | 15.5 | 34.3 | 3.9 | 0.3 | 6 | 76 | 7.2 | 8.2 | 8.1 | 7.9 | | |
| B9140-32 | 309.3 | 87.2 | 6.0 | 19.1 | 19.8 | 1.8 | 0.0 | 6 | 88 | 5.3 | 7.2 | 6.7 | 6.2 | | |
| B9192-1 | 323.8 | 94.0 | 2.3 | 9.4 | 27.1 | 6.1 | 0.4 | 6 | 82 | 5.4 | 7.7 | 7.0 | 7.1 | | |
| B9340-13 | 331.4 | 88.1 | 5.6 | 15.4 | 24.1 | 4.1 | 0.3 | 5 | 78 | 5.3 | 7.3 | 6.7 | 7.2 | | |
| B9384-4 | 304.8 | 80.0 | 10.0 | 17.2 | 21.2 | 1.7 | 0.0 | 5 | 76 | 5.3 | 7.5 | 6.9 | 6.8 | | |
| B9423-4 | 443.1 | 88.6 | 6.5 | 17.1 | 34.0 | 7.2 | 1.0 | 7 | 69 | 7.1 | 10.0 | 9.9 | 10.0 | | |
| B9533-12 | 386.1 | 89.4 | 3.8 | 11.6 | 32.4 | 6.8 | 2.2 | 5 | 84 | 6.8 | 9.1 | 8.5 | 8.5 | | |
| B9536-8 | 390.6 | 92.0 | 3.4 | 17.8 | 28.2 | 5.4 | 1.1 | 7 | 84 | 6.4 | 7.4 | 6.9 | 6.8 | | |
| B9581-10 | 430.9 | 92.5 | 3.8 | 13.3 | 31.4 | 12.0 | 0.8 | 6 | 77 | 7.2 | 9.0 | 8.4 | 8.3 | | |
| B9582-18 | 351.9 | 85.3 | 8.0 | 21.6 | 21.7 | 3.0 | 0.0 | 5 | 82 | 7.2 | 7.9 | 8.1 | 8.0 | | |
| WF31-4 | 368.6 | 90.1 | 3.4 | 16.3 | 25.8 | 6.4 | 1.5 | 6 | 87 | 6.2 | 7.8 | 7.2 | 7.1 | | |
| WF46-3 | 359.5 | 90.1 | 4.2 | 13.0 | 27.8 | 6.5 | 1.0 | 5 | 87 | 6.2 | 7.8 | 7.4 | 7.3 | | |
| WF46-4 | 349.6 | 91.2 | 3.3 | 14.3 | 26.2 | 5.5 | 1.2 | 6 | 87 | 5.8 | 7.9 | 7.6 | 7.9 | | |
| Belchip | 365.6 | 87.3 | 4.0 | 9.8 | 26.9 | 11.4 | 3.0 | 5 | 83 | 5.3 | 7.9 | 6.8 | 7.9 | | |
| ISD 5% | 42.6 | | | | | | | | | | | | | | |

¹1 = poor; 9 = outstanding

²1.0 omitted

³Chips: 1-7 satisfactory

BARC Table 4. Round white yield trial harvested 110 days after planting, Echo Lake, 1985.

| Pedigree | Mkt CWT/A | % | Tuber size distribution | | | | | | Tuber Rating ¹ | Spec Grav ² | Chip Color ³ | | | | |
|----------|--------------|------|-------------------------|--------|--------|--------|--------|-----|------------------------------|---------------------------|-------------------------|---------------|--------|---------------|--|
| | | | 1-7/8" | | 2-1/4" | | 3-1/4" | | | | 50°F 2 mos | 45°F 4 mos | direct | 40°F 4 mos | |
| | | | <1-7/8" | 1-7/8" | 2-1/4" | 3-1/4" | 4" | >4" | | | | | | | |
| | | Mkt | | | | | | | | | | | | | |
| B9930-6 | 253.1 | 66.7 | 16.6 | 25.0 | 8.1 | 0.2 | 0.0 | 5 | 83 | 6.9 | 8.1 | 8.4 | 7.9 | | |
| B9931-1 | 272.8 | 84.9 | 6.4 | 13.6 | 19.3 | 3.0 | 0.0 | 4 | 81 | 6.8 | 8.1 | 8.2 | 8.2 | | |
| " -22 | 250.0 | 85.2 | 5.5 | 12.9 | 17.2 | 2.8 | 0.2 | 4 | 85 | 6.9 | 8.7 | 8.8 | 8.9 | | |
| B9932-46 | 321.5 | 83.4 | 8.4 | 25.4 | 14.6 | 2.3 | 0.0 | 5 | 78 | 7.2 | 8.6 | 9.0 | 9.1 | | |
| " -51 | 329.8 | 74.3 | 14.8 | 27.0 | 14.8 | 1.6 | 0.2 | 5 | 77 | 7.9 | 9.7 | 9.9 | 9.9 | | |
| B9933-2 | 248.5 | 74.8 | 11.0 | 18.5 | 12.8 | 1.4 | 0.0 | 5 | 80 | 7.0 | 7.7 | 7.7 | 7.8 | | |
| " -27 | 403.6 | 93.5 | 1.4 | 7.0 | 32.5 | 13.6 | 2.3 | 6 | 78 | 6.4 | 7.4 | 7.7 | 7.0 | | |
| " -28 | 225.0 | 83.9 | 5.7 | 14.1 | 15.0 | 0.5 | 0.0 | 5 | 75 | 6.7 | 8.1 | 8.2 | 8.1 | | |
| B9935-3 | 299.4 | 82.4 | 8.4 | 20.4 | 16.9 | 2.1 | 0.0 | 5 | 78 | 5.6 | 6.1 | 6.6 | 5.9 | | |
| " -8 | 361.0 | 90.1 | 1.6 | 5.0 | 27.2 | 15.3 | 3.6 | 6 | 71 | 6.0 | 6.7 | 7.2 | 6.4 | | |
| " -10 | 376.2 | 92.5 | 3.2 | 9.8 | 32.1 | 7.6 | 0.8 | 6 | 81 | 6.0 | 6.0 | 6.1 | 5.9 | | |
| " -14 | 323.0 | 90.2 | 4.4 | 12.8 | 24.7 | 5.0 | 0.0 | 5 | 73 | 6.2 | 6.9 | 6.8 | 6.5 | | |
| " -25 | 394.4 | 86.4 | 7.3 | 19.9 | 28.4 | 3.6 | 0.9 | 5 | 83 | 6.0 | 6.9 | 7.1 | 6.7 | | |
| B9955-10 | 296.4 | 77.2 | 11.5 | 25.4 | 13.2 | 0.4 | 0.0 | 5 | 87 | 6.3 | 6.0 | 6.2 | 6.3 | | |
| " -11 | 341.2 | 88.4 | 5.4 | 15.7 | 23.8 | 5.4 | 0.5 | 4 | 91 | 6.6 | 6.9 | 7.0 | 7.1 | | |
| " -18 | 387.6 | 95.3 | 2.3 | 7.7 | 30.9 | 12.4 | 0.2 | 6 | 86 | 7.2 | 7.7 | 7.9 | 7.5 | | |
| Atlantic | 326.0 | 84.0 | 5.9 | 14.4 | 22.8 | 5.7 | 2.3 | 4 | 81 | 7.0 | 7.7 | 8.1 | 8.2 | | |
| Superior | 369.4 | 89.5 | 3.7 | 15.0 | 27.3 | 6.3 | 2.0 | 5 | 72 | 7.6 | 8.1 | 8.3 | 8.4 | | |
| LSD 5% | 41.6 | | | | | | | | | | | | | | |

^{1,2,3}See footnotes Table 2.

BARC Table 5. Round white yield trial harvested 110 days after planting, Echo Lake, 1985.

| Pedigree | Mkt CWT/A | % Mkt | Tuber size distribution | | | | | | Tuber Rating ¹ | Spec Grav ² | Chip Color ³ | | | |
|----------|--------------|----------|-------------------------|--------|---------------|--------|-----------|-----|------------------------------|---------------------------|-------------------------|----------------|--------------|----------------|
| | | | 1-7/8"-2-1/4" | | 2-1/4"-3-1/4" | | 3-1/4"-4" | | | | 50°F 2 mos | 45°F direct | 40°F 40°F | 60°F 14 das |
| | | | <1-7/8" | 1-7/8" | 2-1/4" | 3-1/4" | 4" | >4" | | | | | | |
| B9955-28 | 393.7 | 93.8 | 1.9 | 13.9 | 31.2 | 6.7 | 1.5 | 6 | 76 | 7.4 | 7.6 | 7.6 | 7.7 | |
| " -33 | 356.4 | 94.7 | 2.6 | 7.7 | 30.4 | 8.8 | 0.0 | 5 | 89 | 6.6 | 6.1 | 6.7 | 6.1 | |
| " -46 | 341.2 | 92.4 | 1.0 | 4.9 | 27.1 | 12.9 | 2.7 | 6 | 87 | 6.6 | 6.6 | 7.1 | 6.4 | |
| B9956-24 | 427.9 | 96.4 | 1.5 | 6.2 | 37.9 | 12.2 | 0.6 | 5 | 80 | 9.2 | 9.1 | 9.5 | 9.8 | |
| B9962-2 | 384.6 | 91.8 | 3.0 | 12.6 | 30.9 | 7.1 | 1.5 | 5 | 92 | 6.9 | 7.7 | 7.9 | 6.9 | |
| " -4 | 335.9 | 92.1 | 3.5 | 14.6 | 26.8 | 2.8 | 0.3 | 5 | 73 | 6.8 | 8.2 | 8.3 | 8.0 | |
| " -9 | 333.6 | 91.8 | 3.9 | 17.2 | 24.8 | 1.9 | 0.0 | 5 | 71 | 7.2 | 7.9 | 8.4 | 7.9 | |
| B9988-7 | 437.8 | 90.4 | 4.5 | 16.9 | 33.7 | 7.0 | 1.6 | 4 | 88 | 7.4 | 8.2 | 8.7 | 8.6 | |
| B0011-3 | 280.4 | 90.0 | 4.1 | 15.5 | 19.4 | 2.0 | 0.0 | 5 | 84 | 6.7 | 7.9 | 8.1 | 7.4 | |
| B0032-17 | 284.2 | 85.2 | 6.2 | 15.8 | 18.6 | 3.0 | 0.3 | 5 | 69 | 7.0 | 7.9 | 8.3 | 8.0 | |
| " -35 | 275.1 | 83.8 | 7.0 | 20.5 | 15.2 | 0.5 | 0.0 | 5 | 72 | 7.2 | 8.3 | 8.6 | 8.5 | |
| " -40 | 367.8 | 92.7 | 3.5 | 14.2 | 30.4 | 3.8 | 0.3 | 6 | 67 | 7.6 | 9.2 | 9.7 | 9.5 | |
| B0033-11 | 391.4 | 92.8 | 3.4 | 12.6 | 32.4 | 6.5 | 0.6 | 5 | 80 | 8.2 | 9.0 | 9.7 | 9.5 | |
| " -23 | 380.8 | 88.2 | 6.0 | 22.0 | 26.4 | 1.7 | 0.7 | 5 | 68 | 8.0 | 9.6 | 9.9 | 9.8 | |
| B0035-41 | 340.5 | 88.7 | 1.8 | 6.1 | 27.8 | 10.9 | 3.9 | 6 | 87 | 8.2 | 8.3 | 8.6 | 8.4 | |
| Atlantic | 339.7 | 83.7 | 5.9 | 14.0 | 25.2 | 5.5 | 2.8 | 5 | 85 | 7.8 | 8.2 | 8.6 | 7.9 | |
| Norchip | 376.2 | 86.5 | 7.1 | 21.0 | 26.7 | 1.8 | 0.6 | 4 | 78 | 7.2 | 7.9 | 8.2 | 7.7 | |
| Monona | 351.9 | 93.0 | 1.6 | 6.1 | 28.0 | 12.2 | 1.9 | 5 | 66 | 6.4 | 7.1 | 7.6 | 6.1 | |
| LSD 5% | 52.2 | | | | | | | | | | | | | |

123 See footnotes Table 2.

BARC Table 6. Russet yield trial harvested 109 days after planting, Aroostook Farm, 1985.

| Pedigree | CWT/A | % Mkt | Tuber size distribution | | | | | | | | | | French Fry | | | | | |
|----------------|-------|-------|-------------------------|--------|---------|----------|--------|--------------|------------------------|-----------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | | | | | | | | | | | | | | | | | | |
| | | | <2 oz | 2-6 oz | 6-10 oz | 10-16 oz | >16 oz | Tuber Rating | Spec Grav ¹ | 50°F 2 mos Col ³ | 45°F 4.5 mos Col ³ | 40°F 4.5 mos Col ³ | 40°F 14 days Col ³ | 40°F 14 days Col ³ | 40°F 14 days Col ³ | 40°F 14 days Col ³ | 40°F 14 days Col ³ | 40°F 14 days Col ³ |
| B9164-1 | 258.0 | 88.7 | 4.8 | 19.0 | 19.6 | 6.0 | 0.9 | 5 | 90 | 2.4 | 2.0 | 3.0 | 2.0 | 3.4 | 2.0 | 3.2 | 2.0 | 2.0 |
| B9391-2 | 233.1 | 86.3 | 3.7 | 14.3 | 19.4 | 6.5 | 2.7 | 4 | 86 | 2.4 | 1.8 | 4.0 | 2.0 | 4.1 | 2.0 | 3.9 | 2.1 | 2.1 |
| B9540-55 | 222.7 | 78.2 | 7.1 | 16.4 | 15.8 | 6.2 | 3.6 | 5 | 78 | 1.8 | 1.6 | 3.0 | 1.9 | 3.2 | 2.0 | 2.2 | 1.9 | 1.9 |
| " -62 | 265.0 | 85.4 | 4.6 | 17.5 | 18.6 | 9.7 | 3.2 | 6 | 79 | 2.0 | 2.0 | 3.4 | 2.0 | 3.5 | 2.0 | 2.3 | 2.0 | 2.0 |
| B9553-6 | 207.7 | 82.1 | 7.0 | 17.0 | 14.6 | 4.2 | 0.8 | 5 | 82 | 2.1 | 2.0 | 3.0 | 1.9 | 3.3 | 2.0 | 2.8 | 2.0 | 2.0 |
| B9569-2 | 208.8 | 78.1 | 8.5 | 18.6 | 14.1 | 3.3 | 1.6 | 5 | 75 | 2.8 | 2.0 | 4.7 | 2.0 | 4.7 | 2.0 | 4.3 | 2.0 | 2.0 |
| B9596-2 | 255.8 | 87.7 | 5.2 | 24.4 | 17.1 | 2.6 | 1.0 | 8 | 84 | 2.8 | 1.8 | 3.9 | 2.0 | 4.0 | 2.1 | 3.6 | 2.0 | 2.0 |
| B9738-3 | 229.1 | 89.2 | 4.5 | 18.0 | 17.9 | 3.6 | 0.3 | 5 | 87 | 2.4 | 1.8 | 3.5 | 1.8 | 3.5 | 2.1 | 2.9 | 2.0 | 2.0 |
| " -4 | 198.3 | 72.2 | 11.6 | 21.8 | 10.0 | 2.4 | 1.6 | 5 | 92 | 2.4 | 1.7 | 3.8 | 1.8 | 3.9 | 1.9 | 3.5 | 1.9 | 1.9 |
| B9740-5 | 267.9 | 80.3 | 8.6 | 24.8 | 16.0 | 5.4 | 2.7 | 4 | 100 | 2.5 | 1.4 | 2.9 | 1.7 | 2.9 | 1.8 | 2.4 | 1.8 | 1.8 |
| B9744-1 | 196.6 | 79.6 | 7.2 | 14.9 | 13.6 | 5.4 | 1.5 | 5 | 85 | 1.6 | 2.0 | 3.2 | 1.9 | 3.3 | 1.9 | 2.9 | 1.9 | 1.9 |
| B9750-1 | 205.3 | 76.3 | 9.1 | 18.0 | 12.9 | 4.5 | 1.9 | 6 | 73 | 2.2 | 2.0 | 3.4 | 2.2 | 3.7 | 2.1 | 2.5 | 2.3 | 2.3 |
| B9752-7 | 255.2 | 80.0 | 9.2 | 25.3 | 14.9 | 3.8 | 1.8 | 6 | 78 | 2.8 | 2.0 | 3.7 | 2.1 | 3.9 | 2.1 | 3.0 | 2.2 | 2.2 |
| B9922-11 | 277.8 | 88.5 | 1.8 | 14.3 | 22.3 | 11.3 | 4.4 | 5 | 90 | 2.2 | 1.9 | 3.5 | 1.9 | 3.6 | 1.9 | 3.4 | 1.9 | 1.9 |
| B9843-2 | 222.8 | 84.1 | 6.6 | 18.8 | 16.7 | 3.0 | 0.7 | 6 | 73 | 2.0 | 2.2 | 2.7 | 2.0 | 2.9 | 2.0 | 2.5 | 2.0 | 2.0 |
| BelRus | 219.3 | 83.1 | 6.6 | 20.9 | 14.4 | 2.5 | 1.1 | 7 | 86 | 2.0 | 2.2 | 3.6 | 2.0 | 3.9 | 2.1 | 2.4 | 2.1 | 2.1 |
| Russette | 226.8 | 87.7 | 3.8 | 17.0 | 16.1 | 6.0 | 1.7 | 6 | 91 | 2.6 | 1.7 | 4.0 | 1.7 | 4.0 | 1.8 | 3.2 | 1.8 | 1.8 |
| Russet Burbank | 246.5 | 81.1 | 9.6 | 26.9 | 12.8 | 2.8 | 0.3 | 5 | 84 | 2.4 | 1.6 | 3.9 | 2.0 | 4.2 | 2.0 | 3.1 | 2.0 | 2.0 |
| LSD 5% | 32.0 | | | | | | | | | | | | | | | | | |

¹1 = poor; 9 = outstanding

²1.0 omitted

³French fry color: 1-3 = satisfactory

⁴Texture: 1-2 = satisfactory

BARC Table 7. Russet yield trial harvested 109 days after planting, Aroostook Farm, 1985.

| Pedigree | CWT/A | % Mkt | Tuber size distribution | | | | | | | Tuber Rating ¹ | Spec Grav ² | French Fry | | | | | | | |
|----------|-------|-------|-------------------------|--------|---------|----------|--------|---------------------------|------------------------|---------------------------|------------------------|------------------------|------------------|--------------------------|------------------|--------------------------|------------------|---------------------------|------------------|
| | | | Tuber size distribution | | | | | | | | | 50°F | | 45°F | | 40°F | | 40°-60°F | |
| | | | <2 oz | 2-6 oz | 6-10 oz | 10-16 oz | >16 oz | Tuber Rating ¹ | Spec Grav ² | | | 2 mos Col ³ | Tex ⁴ | 4.5 mos Col ³ | Tex ⁴ | 4.5 mos Col ³ | Tex ⁴ | 40°-60°F Col ³ | Tex ⁴ |
| B9880-17 | 250.0 | 86.9 | 4.5 | 13.9 | 15.7 | 13.5 | 2.0 | 6 | 76 | 2.4 | 1.9 | 3.6 | 2.0 | 4.0 | 2.0 | 3.9 | 2.4 | | |
| B9882-12 | 181.5 | 73.6 | 9.5 | 15.6 | 10.5 | 5.2 | 1.7 | 5 | 76 | 2.2 | 1.8 | 3.7 | 2.2 | 4.0 | 2.1 | 3.2 | 2.4 | | |
| " -15 | 186.2 | 73.0 | 3.6 | 8.5 | 11.4 | 12.2 | 8.3 | 4 | 72 | 2.6 | 2.0 | 3.2 | 2.2 | 3.7 | 2.0 | 2.8 | 2.2 | | |
| " -16 | 205.3 | 85.1 | 6.2 | 14.8 | 13.6 | 7.0 | 0.0 | 6 | 76 | 2.2 | 2.0 | 3.3 | 2.0 | 3.5 | 2.0 | 2.6 | 2.0 | | |
| B9885-2 | 227.4 | 82.9 | 7.5 | 21.0 | 10.5 | 7.7 | 0.6 | 5 | 79 | 2.2 | 1.6 | 2.7 | 2.1 | 3.5 | 2.0 | 2.4 | 2.0 | | |
| " -4 | 211.1 | 73.1 | 12.4 | 21.6 | 9.9 | 4.9 | 1.0 | 6 | 77 | 2.0 | 1.8 | 2.3 | 2.0 | 3.2 | 2.0 | 2.4 | 2.1 | | |
| B9888-4 | 168.8 | 70.6 | 11.5 | 16.9 | 9.0 | 3.2 | 0.6 | 5 | 86 | 2.1 | 1.9 | 3.4 | 2.0 | 3.8 | 2.0 | 3.1 | 2.0 | | |
| B9932-50 | 215.8 | 82.1 | 7.8 | 21.0 | 10.2 | 6.0 | 0.3 | 6 | 99 | 2.3 | 1.6 | 2.7 | 1.7 | 3.7 | 1.9 | 2.4 | 1.8 | | |
| B9933-9 | 247.7 | 85.2 | 6.2 | 20.2 | 17.2 | 5.3 | 1.2 | 6 | 80 | 2.0 | 1.8 | 2.7 | 2.1 | 3.5 | 2.0 | 2.4 | 2.0 | | |
| " -19 | 266.8 | 85.3 | 6.4 | 21.2 | 16.9 | 7.9 | 1.5 | 6 | 80 | 2.0 | 1.8 | 3.0 | 2.0 | 3.5 | 2.0 | 2.3 | 2.0 | | |
| B9937-1 | 225.6 | 77.3 | 5.6 | 15.0 | 15.9 | 8.0 | 5.8 | 5 | 79 | 1.8 | 2.0 | 2.1 | 2.0 | 2.2 | 1.9 | 2.1 | 2.0 | | |
| B9959-15 | 185.6 | 79.0 | 6.1 | 12.1 | 13.6 | 6.3 | 2.4 | 3 | 75 | 2.3 | 2.0 | 3.3 | 2.4 | 3.7 | 2.2 | 3.3 | 2.6 | | |
| " -18 | 211.7 | 74.2 | 8.0 | 14.1 | 14.7 | 7.7 | 4.7 | 4 | 79 | 2.6 | 2.0 | 3.7 | 2.0 | 3.9 | 1.9 | 3.7 | 2.0 | | |
| B0011-16 | 183.9 | 72.4 | 11.7 | 17.8 | 9.2 | 4.7 | 0.4 | 7 | 82 | 2.0 | 1.4 | 2.0 | 1.8 | 3.1 | 1.9 | 2.0 | 1.7 | | |
| B0012-1 | 197.2 | 80.8 | 4.7 | 11.9 | 12.0 | 10.1 | 3.4 | 5 | 81 | 2.0 | 1.8 | 3.1 | 2.0 | 3.4 | 2.0 | 2.4 | 2.1 | | |
| Lemhi | 262.2 | 83.8 | 2.7 | 14.0 | 17.8 | 13.4 | 6.0 | 6 | 89 | 2.7 | 2.4 | 3.2 | 2.3 | 3.9 | 2.1 | 3.4 | 2.4 | | |
| Russette | 233.2 | 88.7 | 3.0 | 12.6 | 17.2 | 10.4 | 2.1 | 5 | 88 | 2.8 | 1.8 | 3.6 | 2.0 | 4.1 | 2.0 | 3.6 | 2.0 | | |
| BelRus | 219.2 | 84.6 | 6.1 | 19.1 | 11.6 | 7.1 | 0.8 | 5 | 86 | 2.2 | 2.0 | 3.7 | 2.0 | 3.8 | 2.1 | 3.3 | 2.1 | | |
| LSD 5% | 33.8 | | | | | | | | | | | | | | | | | | |

1 2 3 4 See footnotes Table 6.

BARC Table 8. Russet yield trial harvested 109 days after planting, Aroostook Farm, 1985.

| Pedigree | CWT/A | % Mkt | Tuber size distribution | | | | | | | Tuber Rating ¹ | Spec Grav ² | French Fry | | | | | | 40°-60° F 14 days Col ³ Tex ⁴ |
|----------|-------|-------|-------------------------|--------|---------|----------|--------|------------------------|------------------|---------------------------|------------------------|--------------------------|------------------|--------------------------|------------------|--------------------------|------------------|---|
| | | | | | | | | | | | | 50° F | | 45° F | | 40° F | | |
| | | | < 2 oz | 2-6 oz | 6-10 oz | 10-16 oz | >16 oz | 2 mos Col ³ | Tex ⁴ | | | 4.5 mos Col ³ | Tex ⁴ | 4.5 mos Col ³ | Tex ⁴ | 4.5 mos Col ³ | Tex ⁴ | |
| B0012-5 | 201.8 | 74.8 | 11.1 | 17.4 | 11.0 | 6.4 | 0.6 | 6 | 78 | 2.7 | 2.4 | 4.1 | 2.6 | 4.7 | 2.5 | 4.3 | 2.7 | |
| " -7 | 221.0 | 90.9 | 3.5 | 13.6 | 13.5 | 11.0 | 0.3 | 6 | 86 | 2.1 | 2.0 | 2.7 | 2.1 | 3.4 | 2.2 | 2.3 | 2.2 | |
| B0019-2 | 215.2 | 83.0 | 6.1 | 16.3 | 13.2 | 7.6 | 1.5 | 5 | 78 | 2.8 | 1.8 | 4.2 | 2.3 | 4.4 | 2.2 | 4.0 | 2.3 | |
| B0036-6 | 212.3 | 83.0 | 5.4 | 15.4 | 14.2 | 7.0 | 2.1 | 4 | 87 | 1.8 | 1.8 | 2.2 | 2.0 | 3.0 | 1.9 | 1.8 | 2.0 | |
| B0038-5 | 191.4 | 77.6 | 9.0 | 15.4 | 10.9 | 6.7 | 0.5 | 5 | 83 | 2.2 | 2.2 | 2.4 | 2.0 | 3.3 | 1.9 | 2.1 | 1.9 | |
| B0039-6 | 146.7 | 69.9 | 10.6 | 12.4 | 10.7 | 2.2 | 0.3 | 5 | 78 | 2.0 | 2.0 | 3.4 | 2.0 | 4.0 | 2.0 | 3.2 | 2.0 | |
| " -10 | 151.4 | 66.9 | 12.9 | 16.0 | 8.6 | 1.5 | 0.0 | 5 | 81 | 2.8 | 2.0 | 4.0 | 2.0 | 4.3 | 2.1 | 3.5 | 2.0 | |
| " -15 | 199.5 | 82.1 | 5.2 | 10.3 | 15.6 | 8.5 | 2.3 | 5 | 82 | 1.8 | 1.8 | 3.0 | 1.9 | 3.6 | 1.8 | 2.7 | 1.9 | |
| " -18 | 179.8 | 79.1 | 6.8 | 13.9 | 13.1 | 4.0 | 1.4 | 5 | 89 | 2.2 | 1.8 | 2.6 | 2.0 | 3.5 | 1.9 | 2.2 | 1.9 | |
| B0042-7 | 178.6 | 69.2 | 13.2 | 19.4 | 8.4 | 3.0 | 0.5 | 5 | 80 | 1.9 | 1.9 | 2.2 | 1.9 | 3.0 | 2.0 | 2.1 | 2.0 | |
| " -11 | 158.3 | 69.5 | 11.4 | 13.7 | 10.3 | 3.3 | 0.6 | 4 | 81 | 2.0 | 2.0 | 2.2 | 1.9 | 2.7 | 1.8 | 1.8 | 2.0 | |
| " -16 | 170.5 | 78.2 | 8.2 | 13.8 | 11.6 | 4.0 | 0.0 | 6 | 84 | 1.9 | 2.0 | 2.8 | 1.8 | 3.8 | 2.0 | 3.2 | 2.0 | |
| B0045-6 | 212.9 | 78.3 | 10.2 | 17.6 | 13.7 | 5.4 | 0.0 | 5 | 95 | 1.9 | 1.8 | 2.9 | 1.7 | 3.4 | 1.7 | 2.4 | 1.6 | |
| B0046-14 | 158.3 | 79.8 | 5.9 | 13.2 | 9.6 | 4.5 | 1.0 | 5 | 84 | 1.8 | 2.0 | 2.2 | 1.9 | 3.0 | 1.8 | 2.1 | 1.9 | |
| B0049-4 | 171.7 | 67.6 | 13.1 | 14.0 | 11.1 | 4.5 | 1.1 | 5 | 84 | 3.2 | 2.0 | 4.0 | 2.0 | 4.5 | 2.0 | 3.5 | 2.0 | |
| Lemhi | 237.8 | 83.2 | 3.9 | 12.2 | 17.1 | 11.7 | 4.4 | 5 | 90 | 2.9 | 2.4 | 3.4 | 2.2 | 3.8 | 2.3 | 3.5 | 2.3 | |
| Russet | 247.7 | 82.0 | 8.0 | 20.5 | 17.2 | 5.0 | 1.4 | 4 | 85 | 2.8 | 1.6 | 4.0 | 2.1 | 4.2 | 1.9 | 3.8 | 2.1 | |
| Burbank | | | | | | | | | | | | | | | | | | |
| Russette | 227.9 | 90.3 | 4.2 | 13.4 | 18.4 | 7.5 | 0.0 | 6 | 88 | 2.7 | 2.0 | 3.8 | 2.0 | 4.3 | 2.0 | 3.3 | 2.0 | |
| LSD 5% | 34.9 | | | | | | | | | | | | | | | | | |

^{1 2 3 4} See footnotes Table 6.

INTER-REGIONAL POTATO INTRODUCTION PROJECT (IR-1)

R.W. Ross, J.B. Bamberg and R.E. Hanneman, Jr.

Introduction of New Stocks

Sixteen introductions were added to the collection -- two in the form of true seed and 14 as tuber clones.

Preservation and Increase of Stocks

Approximately 90 percent of the introductions contained in the collection are maintained as true seed. Satisfactory seed increases of 210 species introductions and intraspecific hybrids were obtained under glass, fiberglass or screen.

A 1000-seed sample, packaged from the most recent seed increase, of each of 340 accessions was forwarded to the National Seed Storage Laboratory (NSSL). This seed will supersede older seed samples held by the NSSL. Germination percentages of 609 seed lots were determined.

Twenty-two accessions have been placed into shoot-tip culture, 103 into meristem culture and 75 into long-term storage. Two hundred and sixty-three accessions are in culture of which 107 have been found to be free of PVS, PVX, PVY, PVA, PVM and PLRV by ELISA and PSTV by dot blot. Nine hundred and twenty-six dot blot DNA hybridization tests were made to check for the presence of potato spindle tuber viroid (PSTV) among all plants used for seed and tuber increases as well as the resultant true seed lots produced. A test history on clonal stocks is updated regularly.

Classification

Dr. Okada spent two weeks here classifying a large group of recent Argentine acquisitions. Another 150 specimens of this group were prepared for inclusion in the herbarium. All are included in the well over 4,000 herbarium mounts, representing specific and interspecific variability of 111 species, now available for taxonomic use.

Distribution of Stocks

Seed and tuber shipments were sent to potato workers in 22 states within this country, as well as to those in 15 other countries, in response to requests. Shipments included 2955 seed and 643 tuber samples of species introductions, and 45 seed and 522 tuber samples of germplasm involving species introductions, developed by the cooperative USDA-Wisconsin Genetics and Cytogenetics Project.

Copies of a listing of 247 species introductions available this year in the form of tuber families as well as true seed were distributed.

Evaluation of Stocks

The somatic chromosome numbers of 636 accessions were determined in the laboratory. Just over 6500 seed samples were distributed under contract, with funds from USDA, ARS and Special Grant Funds from USDA, CSRS, to state and federal laboratories for screening for resistance to Colorado potato beetle, rootknot nematode, early blight, leafhopper and flea

beetle, bacterial wilt, heat and drought stress, and for the presence of 2n gametes. The more recent accessions are being steadily evaluated for characters of economic importance through the cooperative efforts of state, federal and foreign laboratories.

Usefulness of Findings

The major objective of the Inter-Regional Potato Introduction Project is to promote and facilitate the improvement of the commercial potato in the United States by providing a readily available reservoir of useful breeding stocks. Breeders are constantly searching for new sources of superior germplasm and for ways to incorporate desirable new genes into adapted commercial varieties. Accomplishment of the major objective of this program must be measured largely by the success with which new, improved varieties meet the needs of commercial production.

Three new potato varieties, Elba, Hampton and Norking, were released for commercial production in 1985. The number of foreign introductions entering into their pedigrees are 2, 9 and 13, respectively. One hundred sixty five of the 169 potato varieties developed and released in the United States since 1932 have two or more foreign introductions in their pedigree. These varieties presently comprise about 65 percent of the annual seed potato production in the United States.

Basic research programs conducted in several states and other countries continue to provide information concerning the potential value and diversity of the Solanum species, and consequently the knowledge necessary for more effective utilization of the IR-1 germplasm collection. During 1985 42 papers, 20 abstracts, and 8 theses reported the use of Solanum introductions.

NORTH CENTRAL REGIONAL POTATO TRIALS

R. H. Johansen and Cooperators^{1/}

This was the 35th year that the North Central Regional Potato Trials have been conducted. North Dakota State University has coordinated these trials for the past 24 years and there are now 14 states and two provinces conducting trials. In 1985 all cooperators reported data from their trials as no trials were lost this season due to poor weather and growing conditions. This is a first for many years.

Potato cultivars released were:

NORKING RUSSET

Progeny Number: ND388-1Russ

Released by: North Dakota

Parentage: Nooksack x ND9567-2Russ

Year Released: 1985

Cooperating States and Provinces:

| State or or Province | Date Planted | Date Harvested | Total Days to Harvest |
|-------------------------|--------------|----------------|--------------------------|
| Alberta | 5/13 | 10/2 | 143 |
| Manitoba | 5/10 | 9/9 | 123 |
| Colorado | 4/17 | 8/31 | 137 |
| Indiana | 4/24 | 8/21 | 120 |
| Iowa | 4/17 | 8/20 | 126 |
| Kansas | 3/25 | 8/7 | 136 |
| Kentucky | 4/12 | 9/17 | 159 |
| Louisiana | 3/12 | 6/20 | 101 |
| Michigan | 5/8 | 9/23 | 139 |
| Minnesota | 4/18 | 8/14 | 125 |
| Missouri | 3/19 | 8/20 | 145 |
| Nebraska | 5/20 | 10/2 | 136 |
| North Dakota | 5/20 | 9/27 | 131 |
| Ohio | 5/14 | 9/16 | 126 |
| South Dakota | 4/15 | 9/30 | 169 |
| Wisconsin | 4/26 | 9/23 | 151 |

^{1/}Kansas, Dr. J.K. Greig; Louisiana, Dr. James Fontenot; Michigan, Dr. Richard Chase; Minnesota, Dr. Florian Lauer; Missouri, Dr. V.N. Lambeth; Nebraska, Dr. R.B. O'Keefe; Ohio, Dr. Robert Precheur; South Dakota, Dr. Paul Prashar; Wisconsin, Dr. John Schoenemann; Mr. Donald Kichefski, Dr. Stan Peloquin; Alberta, Mr. Clive Schaupmeyer; Manitoba, Mr. Brian Rex; Indiana, Dr. Homer Erickson; Iowa, Dr. Bill Summers; Colorado, Mr. Dan Sullivan; Kentucky, Dr. John Snyder.

Environmental Conditions: Soil types ranged from clay loam to sand; however, the majority of the soil types were silt or sandy. Several states and provinces used irrigation.

Cultural Practices: Fertilizer, fungicides, insecticides, vine killers, herbicides, etc. were all based on local conditions. Insecticides used were Belmark, Thiodan, Decis, Pydrin, Sevin, Thimet, Diazinon, Furadan, Cygon, Guthion, Di-syston, Temik. Fungicides used were Difolatan, Manex, Sulfur, Bravo, Dithane M-45, Ridomil MZ58, Mancozeb, Dithane. The most common herbicides used were Sincor, Lorox, Lexone DF+Dual, Lasso. Vines were killed mechanically and by the chemical Reglone (Diquat).

Weather and Growing Conditions: The weather cooperated very nicely in 1985 as no trials were lost due to flooding or adverse weather conditions. Missouri had the most favorable temperature and rainfall in many years. It was cool and wet in Manitoba. In general, it was quite cool in the northern states and provinces throughout the season. Rainfall varied throughout the season but no location suffered severely from drought or high temperature. Weather conditions were quite favorable for potato production at all locations.

Entries: Entries were received from Louisiana, Minnesota, North Dakota, Michigan, Wisconsin and Nebraska. Ontario entered a selection through Michigan.

Total and US No. 1 Yield: Red Pontiac once again produced the highest total and US No. 1 yield (North Central Regional Table 1 and 2). Other high yielders were ND651-9, G670-11, NE9.75-1, La12-59, La01-38 and MS700-83. Michigan produced the highest yield while Manitoba produced the lowest.

Percent U.S. No. 1: Indiana and Wisconsin produced the highest and Manitoba the lowest percent U.S. No. 1. Among the entries, La01-38 again produced the highest percent U.S. No. 1. Russet Burbank produced the lowest (North Central Regional Table 3).

Maturity: Norland and Minn. 11705 were the earliest entries while Russet Burbank and G670-11 were the latest. There were five entries in the early classification, which was the highest number in many years. (North Central Regional Table 4)

Percent Total Solids: Wisconsin 842 produced the highest and Red Pontiac the lowest percent total solids. Also quite high were G670-11 and MS716-15. Iowa produced the lowest and Manitoba the highest total solids. (North Central Regional Table 5).

Scab Reaction: Indiana and Nebraska reported the severest scab while Alberta reported only a trace. Severe scab was reported for NE106 (North Central Regional Table 6).

Summary of Grade Defects: Grade defects are found in North Central Regional Table 7. Again, certain selections or cultivars are starred (*) to point out various serious external or defects. Russet Burbank had 27.8 percent second growth and only 66.4% tubers totally free of external problems. This cultivar had by far the most serious grade defect for all entries.

Chip Quality: The outstanding chippers were Minn. 11705, ND860-2, ND651-9, La01-38, MS716-15, G670-11 and Wisc. 842. In general, these selections were as good or better than the standard chip cultivar Norchip (North Central Regional Table 8).

Early Blight Readings: Of the sixteen cooperators, eight reported early blight readings. No entry except Norland appeared to have any amount of early blight (North Central Regional Table 9).

Overall Merit Ratings^{1/}: Merit ratings for 1985 are found in North Central Regional Table 10.

| <u>Cultivar or Selection</u> | <u>1983</u> | <u>1984</u> | <u>1985</u> |
|------------------------------|-------------|-------------|-------------|
| La. 01-38 | 15 | 35 | 28 |
| G670-11 | 0 | 0 | 27 |
| La. 12-59 | 0 | 0 | 24 |
| MS716-15 | 0 | 0 | 23 |
| ND651-9 | 0 | 0 | 22 |

^{1/} Merit Ratings

| <u>Rating</u> | <u>Points</u> |
|---------------|---------------|
| 1 | 5 |
| 2 | 4 |
| 3 | 3 |
| 4 | 2 |
| 5 | 1 |

North Central Regional Trial Table 1. Total Yield (Cwt/Acre) - 1985.

| Cultivar or Selection | Alb. | Man. | CO | IN | IA | KS | KY | LA | MI | MN | MO | NE | OH | ND | SD | WI | Ave. |
|--------------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| <u>Early to</u> | | | | | | | | | | | | | | | | | |
| <u>Medium Early</u> | | | | | | | | | | | | | | | | | |
| Norland | 433 | 107 | 380 | 484 | 386 | 121 | 247 | 208 | 341 | 537 | 247 | 348 | 460 | 218 | 285 | 445 | 328 |
| MN11705 | 318 | 78 | 316 | 461 | 321 | 160 | 215 | 113 | 166 | 454 | 201 | 283 | 388 | 159 | 294 | 408 | 271 |
| NE9.75-1 | 368 | 124 | 400 | 501 | 338 | 164 | 339 | NR | 437 | 620 | 380 | 287 | 600 | 243 | 505 | 533 | 389 |
| ND651-9 | 476 | 109 | 418 | 703 | 373 | 314 | 368 | 99 | 343 | 650 | 489 | 394 | 571 | 202 | 496 | 447 | 403 |
| ND860-2 | 373 | 95 | 315 | 577 | 315 | 113 | 267 | 169 | 202 | 436 | 286 | 342 | 471 | 178 | 329 | 384 | 303 |
| <u>Medium to Late</u> | | | | | | | | | | | | | | | | | |
| La. 12-59 | 423 | 97 | 513 | 676 | 348 | 274 | 364 | 164 | 414 | 572 | 355 | 321 | 640 | 273 | 392 | 547 | 398 |
| La. 01-38 | 468 | 75 | 389 | 649 | 384 | 216 | 460 | 170 | 480 | 516 | 394 | 239 | 580 | 212 | 396 | 485 | 382 |
| MS700-83 | 440 | 90 | 484 | 659 | 394 | 263 | 287 | 171 | 464 | 515 | 342 | 349 | 512 | 212 | 450 | 499 | 383 |
| MS704-10 | 531 | 105 | 394 | 589 | 365 | 176 | 332 | 113 | 389 | 532 | 391 | 336 | 477 | 182 | 180 | 450 | 346 |
| MS716-15 | 449 | 95 | 416 | 593 | 386 | 191 | 346 | 121 | 375 | 581 | 340 | 306 | 526 | 173 | 461 | 468 | 364 |
| G670-11 | NR | 86 | 456 | 634 | 348 | 273 | 422 | 167 | 493 | 554 | 384 | 303 | 514 | 226 | 617 | 673 | 410 |
| MN 11816 | 421 | 55 | 337 | 466 | 308 | 115 | 284 | 53 | 173 | 591 | 164 | 149 | 507 | 164 | 234 | 450 | 279 |
| MN 11903 | 358 | 68 | 314 | 570 | 308 | 113 | 263 | 39 | 320 | 465 | 178 | 223 | 488 | 159 | 258 | 432 | 285 |
| NE 106 | 346 | 89 | 408 | 434 | 297 | 127 | 304 | NR | 382 | 515 | 275 | 283 | 500 | 238 | 327 | 414 | 329 |
| BN 9815-3 | 436 | 106 | 332 | 448 | 320 | 158 | 343 | NR | 222 | 436 | 293 | 215 | 540 | 202 | 374 | 455 | 325 |
| ND671-4Russ | 436 | 96 | 419 | 538 | 308 | 248 | 320 | 50 | 367 | 537 | 353 | 333 | 516 | 238 | 499 | 459 | 357 |
| W 842 | 289 | 75 | 383 | 473 | 342 | 212 | 342 | 121 | 387 | 477 | 351 | 264 | 439 | 207 | 390 | 536 | 331 |
| W 903 | 319 | 63 | 373 | 592 | 383 | 226 | 368 | 109 | 452 | 435 | 359 | 275 | 471 | 176 | 428 | 479 | 344 |
| W 949R | 547 | 83 | 408 | 564 | 373 | 204 | 362 | 116 | 435 | 500 | 329 | 280 | 475 | 233 | 312 | 526 | 359 |
| Red Pontiac | 562 | 130 | 541 | 761 | 514 | 216 | 458 | 183 | 580 | 720 | 502 | 378 | 773 | 294 | 584 | 708 | 494 |
| Russet Burbank 418 | | 95 | 375 | 605 | 336 | 167 | 372 | 23 | 383 | 642 | 455 | 370 | 598 | 199 | 485 | 582 | 382 |
| Norgold Russet 485 | | 74 | 319 | 534 | 373 | 344 | 272 | 112 | 273 | 468 | 351 | 349 | 492 | 208 | 376 | 465 | 343 |
| Norchip | 470 | 92 | 315 | 624 | 312 | 244 | 346 | 91 | 317 | 481 | 309 | 415 | 495 | 241 | 147 | 460 | 336 |
| Average | 426 | 91 | 392 | 571 | 354 | 202 | 334 | 120 | 365 | 532 | 337 | 306 | 523 | 210 | 383 | 492 | 354 |

NR - Not Received

North Central Regional Trial Table 2. U.S. No. 1 Yield (Cwt/Acre) - 1985

| Cultivar or Selection | Alb. | Man. | CO | IN | IA | KS | KY | LA | MI | MN | MO | NE | OH | ND | SD | WI | Ave. |
|--------------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| <u>Early to</u> | | | | | | | | | | | | | | | | | |
| <u>Medium Early</u> | | | | | | | | | | | | | | | | | |
| Norland | 387 | 78 | 317 | 455 | 325 | 98 | 239 | 176 | 314 | 524 | 209 | 288 | 400 | 201 | 265 | 420 | 294 |
| MN11705 | 207 | 21 | 158 | 424 | 235 | 86 | 180 | 84 | 72 | 434 | 113 | 170 | 306 | 112 | 249 | 358 | 201 |
| NE9.75-1 | 298 | 75 | 260 | 461 | 240 | 116 | 306 | NR | 379 | 619 | 292 | 180 | 520 | 166 | 465 | 499 | 325 |
| ND651-9 | 338 | 60 | 197 | 661 | 302 | 245 | 337 | 65 | 286 | 580 | 392 | 208 | 494 | 163 | 463 | 410 | 325 |
| ND860-2 | 273 | 56 | 171 | 537 | 255 | 59 | 241 | 123 | 137 | 417 | 209 | 138 | 406 | 145 | 289 | 358 | 238 |
| <u>Medium to Late</u> | | | | | | | | | | | | | | | | | |
| La. 12-59 | 363 | 74 | 429 | 629 | 284 | 230 | 345 | 120 | 392 | 554 | 313 | 257 | 559 | 254 | 361 | 521 | 355 |
| La. 01-38 | 355 | 64 | 363 | 623 | 335 | 185 | 450 | 134 | 463 | 510 | 342 | 195 | 535 | 182 | 385 | 473 | 350 |
| MS700-83 | 343 | 60 | 369 | 613 | 345 | 171 | 267 | 125 | 423 | 503 | 270 | 212 | 450 | 183 | 410 | 477 | 326 |
| MS704-10 | 323 | 63 | 309 | 554 | 328 | 132 | 303 | 77 | 351 | 521 | 319 | 169 | 395 | 151 | 167 | 425 | 287 |
| MS716-15 | 304 | 44 | 313 | 569 | 356 | 138 | 328 | 88 | 330 | 566 | 270 | 140 | 473 | 143 | 425 | 450 | 309 |
| G670-11 | NR | 61 | 382 | 615 | 267 | 141 | 412 | 136 | 445 | 541 | 344 | 129 | 438 | 168 | 586 | 657 | 355 |
| MN 11816 | 305 | 26 | 277 | 452 | 261 | 81 | 264 | 34 | 129 | 581 | 135 | 60 | 423 | 133 | 200 | 422 | 236 |
| MN 11903 | 260 | 35 | 240 | 524 | 237 | 78 | 249 | 30 | 290 | 454 | 135 | 141 | 400 | 135 | 240 | 414 | 241 |
| NE 106 | 286 | 57 | 276 | 412 | 226 | 89 | 283 | NR | 334 | 497 | 219 | 195 | 416 | 204 | 299 | 386 | 279 |
| BN9815-3 | 324 | 74 | 209 | 435 | 235 | 122 | 323 | NR | 199 | 414 | 251 | 101 | 478 | 145 | 350 | 434 | 273 |
| ND671-4Russ | 250 | 64 | 318 | 522 | 241 | 152 | 290 | 32 | 252 | 522 | 266 | 155 | 442 | 194 | 443 | 412 | 285 |
| W 842 | 167 | 43 | 253 | 445 | 211 | 144 | 308 | 77 | 345 | 462 | 286 | 114 | 375 | 161 | 358 | 512 | 266 |
| W 903 | 208 | 43 | 241 | 562 | 281 | 202 | 353 | 79 | 348 | 419 | 268 | 157 | 406 | 139 | 385 | 441 | 283 |
| W 949R | 417 | 64 | 335 | 547 | 307 | 160 | 339 | 84 | 413 | 485 | 275 | 207 | 420 | 213 | 298 | 503 | 317 |
| Red Pontiac | 420 | 108 | 453 | 731 | 338 | 177 | 438 | 139 | 509 | 697 | 402 | 185 | 664 | 256 | 557 | 694 | 423 |
| Russet Burbank | 237 | 49 | 239 | 563 | 50 | 103 | 341 | 15 | 245 | 622 | 336 | 166 | 335 | 114 | 417 | 537 | 273 |
| Norgold Russet | 326 | 44 | 239 | 497 | 306 | 263 | 241 | 70 | 153 | 450 | 247 | 210 | 435 | 166 | 327 | 399 | 273 |
| Norchip | 320 | 54 | 200 | 599 | 220 | 183 | 314 | 54 | 277 | 471 | 270 | 231 | 404 | 203 | 138 | 438 | 274 |
| Average | 305 | 57 | 285 | 540 | 269 | 146 | 311 | 87 | 308 | 515 | 268 | 174 | 442 | 163 | 351 | 463 | 295 |

NR - Not Received

North Central Regional Trial Table 3. Average Percent U.S. No. 1 (over 2" Diameter) - 1985

| Cultivar or Selection | Alb. | Man. | CO | IN | IA | KS | KY | LA | MI | MN | MO | NE | OH | ND | SD | WI | Ave. |
|------------------------------|------|------|----|----|----|----|----|----|----|-----|----|----|----|----|----|----|------|
| <u>Early to Medium Early</u> | | | | | | | | | | | | | | | | | |
| Norland | 90 | 73 | 84 | 94 | 84 | 81 | 96 | 85 | 92 | 98 | 85 | 83 | 87 | 92 | 93 | 94 | 88 |
| MN11705 | 65 | 26 | 50 | 92 | 73 | 54 | 83 | 74 | 43 | 96 | 56 | 60 | 78 | 70 | 85 | 88 | 68 |
| NE9.75-1 | 81 | 61 | 64 | 92 | 71 | 71 | 90 | NR | 87 | 100 | 77 | 63 | 86 | 68 | 92 | 94 | 80 |
| ND651-9 | 71 | 55 | 48 | 94 | 81 | 78 | 92 | 66 | 83 | 97 | 80 | 53 | 86 | 81 | 93 | 92 | 78 |
| ND860-2 | 73 | 59 | 57 | 93 | 81 | 52 | 90 | 73 | 68 | 96 | 73 | 40 | 86 | 81 | 88 | 93 | 75 |
| <u>Medium to Late</u> | | | | | | | | | | | | | | | | | |
| La. 12-59 | 86 | 76 | 84 | 93 | 81 | 84 | 95 | 73 | 95 | 97 | 88 | 80 | 87 | 93 | 92 | 95 | 87 |
| La. 01-38 | 76 | 85 | 93 | 96 | 87 | 86 | 98 | 79 | 96 | 99 | 87 | 82 | 92 | 86 | 97 | 98 | 90 |
| MS700-83 | 78 | 67 | 76 | 93 | 88 | 65 | 93 | 73 | 91 | 98 | 79 | 61 | 87 | 86 | 91 | 96 | 83 |
| MS704-10 | 61 | 60 | 79 | 94 | 90 | 75 | 91 | 68 | 93 | 98 | 82 | 50 | 82 | 83 | 93 | 94 | 81 |
| MS716-15 | 68 | 47 | 75 | 96 | 92 | 72 | 95 | 73 | 88 | 97 | 79 | 46 | 89 | 83 | 92 | 96 | 81 |
| G670-11 | NR | 71 | 84 | 97 | 77 | 88 | 98 | 81 | 90 | 98 | 90 | 43 | 84 | 74 | 95 | 98 | 85 |
| MN 11816 | 73 | 48 | 82 | 97 | 85 | 70 | 93 | 64 | 74 | 98 | 82 | 40 | 83 | 81 | 85 | 94 | 78 |
| MN 11903 | 73 | 51 | 76 | 92 | 77 | 69 | 94 | 77 | 91 | 98 | 76 | 63 | 89 | 85 | 93 | 96 | 81 |
| NE 106 | 83 | 64 | 67 | 95 | 76 | 70 | 93 | NR | 87 | 97 | 80 | 69 | 83 | 86 | 91 | 93 | 82 |
| BN9815-3 | 75 | 70 | 62 | 97 | 74 | 77 | 94 | NR | 90 | 95 | 86 | 47 | 88 | 72 | 94 | 95 | 76 |
| ND671-4Russ | 47 | 67 | 75 | 97 | 78 | 67 | 91 | 64 | 69 | 97 | 75 | 46 | 85 | 81 | 89 | 90 | 76 |
| W 842 | 48 | 57 | 66 | 94 | 62 | 68 | 90 | 64 | 89 | 97 | 82 | 43 | 85 | 78 | 92 | 96 | 76 |
| W 903 | 65 | 67 | 64 | 95 | 73 | 68 | 96 | 72 | 77 | 96 | 75 | 57 | 86 | 79 | 90 | 92 | 78 |
| W 949R | 76 | 77 | 82 | 97 | 82 | 77 | 94 | 72 | 95 | 97 | 84 | 74 | 88 | 91 | 96 | 96 | 86 |
| Red Pontiac | 75 | 83 | 84 | 96 | 66 | 82 | 96 | 76 | 88 | 97 | 80 | 49 | 85 | 87 | 95 | 98 | 84 |
| Russet Burbank | 57 | 52 | 63 | 93 | 15 | 62 | 91 | 65 | 64 | 97 | 74 | 45 | 55 | 57 | 86 | 92 | 67 |
| Norgold Russet | 67 | 59 | 75 | 93 | 82 | 76 | 88 | 63 | 56 | 96 | 70 | 60 | 88 | 80 | 87 | 86 | 77 |
| Norchip | 68 | 58 | 63 | 96 | 70 | 75 | 91 | 59 | 88 | 98 | 82 | 56 | 81 | 84 | 94 | 95 | 79 |
| Average | 71 | 62 | 72 | 95 | 76 | 72 | 93 | 71 | 82 | 97 | 79 | 57 | 84 | 81 | 91 | 94 | 80 |
| NR - Not Received | | | | | | | | | | | | | | | | | |

North Central Regional Trial Table 4. Maturity Classification^{1/} - 1985

| Cultivar or Selection | Alb. | Man. | CO | IN | IA | KS | KY | LA | MI | MN | MO | NE | OH | ND | SD | WI | Ave. |
|--------------------------|------|------|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|------|
| <u>Early to</u> | | | | | | | | | | | | | | | | | |
| <u>Medium Early</u> | | | | | | | | | | | | | | | | | |
| Norland | ND | 1.0 | 1.3 | 1.8 | 1.0 | 3.5 | 1.0 | 1.0 | 1.0 | ND | 1.0 | 2.0 | 3.0 | 1.5 | 2.0 | 2.0 | 1.7 |
| MN11705 | ND | 1.0 | 1.0 | 1.5 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | ND | 1.0 | 2.0 | 2.0 | 1.2 | 2.0 | 1.0 | 1.4 |
| NE9.75-1 | ND | 4.0 | 3.0 | 3.8 | 3.0 | 4.0 | 4.0 | NR | 2.0 | ND | 3.0 | 2.0 | 3.0 | 4.5 | 2.0 | 3.0 | 3.2 |
| ND651-9 | ND | 1.5 | 1.5 | 2.5 | 2.0 | 4.0 | 2.8 | 1.0 | 2.0 | ND | 2.5 | 3.0 | 3.0 | 2.0 | 2.0 | 2.0 | 2.3 |
| ND860-2 | ND | 1.0 | 1.0 | 2.8 | 2.0 | 4.0 | 2.0 | 1.0 | 1.0 | ND | 2.5 | 3.0 | 2.0 | 1.2 | 1.0 | 2.0 | 1.9 |
| <u>Medium to Late</u> | | | | | | | | | | | | | | | | | |
| La. 12-59 | ND | 3.0 | 3.8 | 3.5 | 4.0 | 3.7 | 2.8 | 3.0 | 4.0 | ND | 4.0 | 3.0 | 5.0 | 4.2 | 3.0 | 3.0 | 3.5 |
| La. 01-38 | ND | 4.0 | 3.0 | 4.2 | 4.0 | 4.3 | 4.3 | 3.0 | 4.0 | ND | 4.5 | 3.0 | 5.0 | 4.0 | 3.0 | 3.5 | 3.8 |
| MS700-83 | ND | 2.5 | 3.0 | 3.2 | 3.0 | 4.0 | 2.5 | 2.0 | 3.0 | ND | 2.5 | 2.0 | 3.0 | 3.5 | 1.0 | 3.0 | 2.7 |
| MS704-10 | ND | 3.5 | 3.0 | 3.2 | 3.0 | 3.0 | 3.0 | 2.0 | 3.0 | ND | 3.0 | 3.0 | 4.0 | 3.0 | 4.0 | 3.0 | 3.1 |
| MS716-15 | ND | 3.5 | 3.5 | 3.8 | 3.0 | 5.0 | 4.0 | 1.0 | 4.0 | ND | 3.0 | 3.0 | 4.0 | 3.0 | 2.0 | 3.5 | 3.3 |
| G670-11 | NR | 4.0 | 3.8 | 4.2 | 5.0 | 5.0 | 4.8 | 4.0 | 5.0 | ND | 5.0 | 4.0 | 5.0 | 5.0 | 2.0 | 4.0 | 4.3 |
| MN 11816 | ND | 2.0 | 2.3 | 3.2 | 3.0 | 4.0 | 3.3 | 2.0 | 3.0 | ND | 3.0 | 3.0 | 3.0 | 2.2 | 3.0 | 3.0 | 2.9 |
| MN 11903 | ND | 2.0 | 2.3 | 2.5 | 3.0 | 3.0 | 1.3 | 1.0 | 3.0 | ND | 3.0 | 2.0 | 3.0 | 2.2 | 3.0 | 3.0 | 2.5 |
| NE 106 | ND | 3.5 | 4.0 | 3.2 | 5.0 | 4.5 | 2.0 | NR | 4.0 | ND | 3.5 | 2.0 | 4.0 | 4.0 | 3.0 | 4.0 | 3.6 |
| BN9815-3 | ND | 3.0 | 2.3 | 3.8 | 3.0 | 3.5 | 3.3 | NR | 3.0 | ND | 3.0 | 3.0 | 4.0 | 3.0 | 2.0 | 3.0 | 3.1 |
| ND671-4Russ | ND | 3.0 | 2.3 | 3.8 | 4.0 | 4.0 | 2.5 | 3.0 | 3.0 | ND | 4.0 | 3.0 | 3.0 | 2.7 | 3.0 | 3.0 | 3.2 |
| W 842 | ND | 4.0 | 3.0 | 4.0 | 5.0 | 4.5 | 4.5 | 3.0 | 4.0 | ND | 4.0 | 3.0 | 4.0 | 4.0 | 4.0 | 4.5 | 3.9 |
| W 903 | ND | 3.0 | 3.0 | 4.0 | 4.0 | 3.5 | 2.5 | 3.0 | 3.0 | ND | 3.5 | 3.0 | 4.0 | 3.7 | 3.0 | 4.0 | 3.4 |
| W 949R | ND | 2.0 | 2.3 | 3.2 | 4.0 | 4.0 | 3.0 | 2.0 | 3.0 | ND | 3.5 | 3.0 | 3.0 | 2.7 | 5.0 | 4.0 | 3.2 |
| Red Pontiac | ND | 4.0 | 4.3 | 3.8 | 3.0 | 5.0 | 4.3 | 4.0 | 3.0 | ND | 3.0 | 4.0 | 4.0 | 4.0 | 3.0 | 5.0 | 3.9 |
| Russet Burbank | ND | 4.0 | 3.8 | 4.0 | 5.0 | 4.6 | 5.0 | 5.0 | 4.0 | ND | 5.0 | 4.0 | 5.0 | 5.0 | 5.0 | 5.0 | 4.6 |
| Norgold Russet | ND | 3.0 | 1.5 | 3.5 | 3.0 | 4.5 | 1.5 | 3.0 | 3.0 | ND | 3.5 | 3.0 | 3.0 | 2.2 | 2.0 | 3.0 | 2.8 |
| Norchip | ND | 2.5 | 2.5 | 3.5 | 2.0 | 4.2 | 2.8 | 3.0 | 3.0 | ND | 3.0 | 2.0 | 4.0 | 3.0 | 3.0 | 3.5 | 3.0 |
| Average | -- | 2.8 | 2.7 | 3.4 | 3.3 | 3.9 | 2.9 | 2.4 | 3.0 | | 3.2 | 2.8 | 3.6 | 3.1 | 2.7 | 3.3 | 3.1 |

ND - No Data
NR - Not Received

1. Very early - Norland Maturity
2. Early - Irish Cobbler Maturity
3. Medium - Red Pontiac Maturity
4. Late - Katahdin Maturity
5. Very Late - Russet Burbank Maturity

North Central Regional Trial Table 5. Percent Total Solids - 1985

| Cultivar or Selection | Alb. | Man. | CO | IN | IA | KS | KY | LA | MI | MN | MO | NE | OH | ND | SD | WI | Ave. |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <u>Early to Medium Early</u> | | | | | | | | | | | | | | | | | |
| Norland | 19.6 | 21.0 | 16.3 | 14.2 | 12.1 | 15.8 | 13.0 | 14.8 | 15.0 | 15.4 | 16.7 | 20.1 | 18.1 | 18.6 | 16.3 | 15.2 | 16.4 |
| MN1705 | 20.8 | 22.2 | 17.8 | 16.4 | 16.0 | ND | 14.9 | 15.3 | 16.9 | 17.1 | 17.5 | 20.5 | 19.8 | 19.7 | 19.1 | 17.3 | 18.1 |
| NE9.75-1 | 20.5 | 20.0 | 19.0 | 17.0 | 15.5 | 18.8 | 15.0 | NR | 17.5 | 16.9 | 18.0 | 18.6 | 19.2 | 19.4 | 17.8 | 17.7 | 18.1 |
| ND651-9 | 21.9 | 21.2 | 17.6 | 17.0 | 15.6 | 17.5 | 15.4 | 14.8 | 17.7 | 17.3 | 18.4 | 19.0 | 19.2 | 20.9 | 18.9 | 16.7 | 18.1 |
| ND860-2 | 22.7 | 22.8 | 18.4 | 16.8 | 16.4 | 19.9 | 15.8 | 16.2 | 18.4 | 18.0 | 18.6 | 19.9 | 20.6 | 21.6 | 18.7 | 16.9 | 18.9 |
| <u>Medium to Late</u> | | | | | | | | | | | | | | | | | |
| La. 12-59 | 22.5 | 22.8 | 21.2 | 17.5 | 16.4 | 17.1 | 15.9 | 14.8 | 18.8 | 18.6 | 17.5 | 19.9 | 20.6 | 22.2 | 19.6 | 18.8 | 19.0 |
| La. 01-38 | 22.2 | 21.5 | 19.3 | 16.6 | 17.1 | 16.7 | 15.6 | 14.8 | 19.2 | 20.3 | 17.1 | 20.3 | 20.0 | 22.0 | 17.8 | 19.0 | 18.7 |
| MS700-83 | 21.2 | 22.0 | 20.1 | 16.8 | 15.3 | 17.7 | 16.0 | 15.4 | 19.2 | 17.3 | 18.4 | 19.9 | 18.9 | 21.6 | 19.1 | 19.0 | 18.6 |
| MS704-10 | 23.3 | 23.5 | 20.5 | 17.5 | 16.7 | 19.7 | 16.9 | 16.2 | 20.3 | 16.9 | 19.2 | 21.4 | 21.3 | 22.9 | 20.4 | 18.8 | 19.7 |
| MS716-15 | 24.2 | 24.1 | 22.3 | 18.3 | 18.8 | 20.5 | 17.6 | 17.3 | 20.9 | 21.6 | 19.4 | 21.4 | 21.1 | 24.2 | 20.6 | 20.9 | 20.8 |
| G670-11 | NR | 23.3 | 23.8 | 20.1 | ND | 19.0 | 16.8 | 16.7 | 21.8 | 21.8 | 20.5 | 22.4 | 22.3 | 22.9 | 20.8 | 21.6 | 20.9 |
| MN 11816 | 22.6 | 21.2 | 17.8 | 17.0 | ND | 18.0 | 15.7 | 14.8 | 17.1 | 18.6 | 18.2 | 18.8 | 17.7 | 20.1 | 19.8 | 17.1 | 18.3 |
| MN 11903 | 20.4 | 20.2 | 17.1 | 15.5 | 15.5 | 16.9 | 13.7 | 15.2 | 16.7 | 15.2 | 17.7 | 20.3 | 19.0 | 20.1 | 18.9 | 16.0 | 17.4 |
| NE 106 | 22.1 | 22.2 | 21.0 | 17.3 | 17.2 | 17.3 | 15.9 | NR | 19.4 | 20.9 | 19.0 | 20.7 | 21.1 | 18.8 | 19.8 | 19.4 | 19.5 |
| BN9815-3 | 21.4 | 22.4 | 19.3 | 16.4 | 16.6 | 19.2 | 16.3 | NR | 18.8 | 18.0 | 18.0 | 20.7 | 19.6 | 20.3 | 20.0 | 18.4 | 19.0 |
| ND671-4Russ | 19.9 | 20.0 | 16.7 | 15.0 | 13.9 | 15.6 | 14.5 | 14.8 | 18.0 | 16.5 | 18.8 | 18.6 | 18.1 | 19.2 | 18.5 | 16.9 | 17.2 |
| W 842 | 25.2 | 23.5 | 23.8 | 19.7 | 19.7 | 19.4 | 17.6 | 18.2 | 22.0 | 23.3 | 20.7 | 21.6 | 24.2 | 24.4 | 17.6 | 22.4 | 21.5 |
| W 903 | 20.5 | 19.4 | 18.2 | 15.0 | 15.4 | 15.8 | 14.9 | 14.8 | 17.5 | 16.5 | 16.5 | 19.4 | 17.9 | 20.9 | 19.8 | 16.7 | 17.5 |
| W 949R | 19.8 | 19.8 | 16.3 | 15.2 | 15.7 | 15.6 | 13.6 | 14.8 | 16.7 | 16.7 | 16.2 | 18.6 | 18.3 | 19.0 | 18.0 | 17.5 | 16.9 |
| Red Pontiac | 18.7 | 20.4 | 16.1 | 14.2 | 12.7 | 16.2 | 12.7 | 14.8 | 15.6 | 15.4 | 14.5 | 16.7 | 18.1 | 18.6 | 13.4 | 16.0 | 15.9 |
| Russet Burbank | 18.3 | 22.2 | 19.7 | 17.5 | 16.0 | 17.5 | 16.5 | 14.8 | 19.4 | 19.9 | 18.0 | 20.7 | ND | 22.7 | 18.9 | 19.9 | 18.8 |
| Norgold Russet | 21.4 | 20.6 | 17.3 | 15.7 | 15.3 | 17.3 | 14.4 | 14.8 | 17.1 | 16.7 | 17.7 | 20.1 | 19.6 | 19.4 | 18.2 | 16.9 | 17.7 |
| Norchip | 23.1 | 22.0 | 20.1 | 17.5 | 18.5 | 19.9 | 15.9 | 14.8 | 19.2 | 18.4 | 19.2 | 20.5 | 20.6 | 22.2 | 18.4 | 18.6 | 19.3 |
| Average | 21.2 | 21.7 | 19.1 | 16.7 | 16.0 | 17.8 | 15.4 | 15.4 | 18.4 | 18.1 | 18.1 | 20.0 | 19.7 | 20.9 | 18.7 | 18.2 | 18.5 |

NR - Not Received

ND - No Data

North Central Regional Trial Table 6. Scab Reaction Report. Most Representative Scab (Area-Type)^{1/} - 1985

| Cultivar or Selection | Alb. | Man. | CO | IN | IA | KS | KY | LA | MI | MN | MO | NE | OH | ND | SD | WI |
|------------------------------|------|------|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|
| <u>Early to Medium Early</u> | | | | | | | | | | | | | | | | |
| Norland | 0-0 | 1-1 | -- | 2-2 | 0-0 | 1-1 | 0-0 | T-1 | 0-0 | ND | T-1 | 1-1 | T-1 | T-1 | T-1 | 0-0 |
| MN11705 | 0-0 | T-1 | T-3 | 2-2 | T-3 | 1-1 | 0-0 | T-1 | 0-0 | ND | T-1 | 2-4 | 0-0 | T-1 | T-1 | 0-0 |
| NE9.75-1 | 0-0 | 1-1 | -- | 3-2 | 0-0 | 1-1 | 0-0 | NR | 1-3 | ND | T-3 | 1-3 | 1-1 | T-1 | T-3 | 2-2 |
| ND651-9 | 0-0 | 2-1 | 1-4 | 3-2 | T-2 | 2-1 | T-1 | 0-0 | T-3 | ND | T-1 | 2-3 | T-3 | T-1 | T-1 | 0-0 |
| ND860-2 | 0-0 | T-1 | 1-4 | 3-2 | 0-0 | 1-1 | 0-0 | T-1 | 0-0 | ND | T-1 | 2-4 | T-1 | T-1 | T-1 | 0-0 |
| <u>Medium to Late</u> | | | | | | | | | | | | | | | | |
| La. 12-59 | 0-0 | T-1 | -- | 3-2 | 0-0 | 1-1 | 0-0 | T-1 | 0-0 | ND | T-1 | 2-2 | 0-0 | T-1 | T-1 | 0-0 |
| La. 01-38 | 0-0 | T-1 | -- | 3-3 | 0-0 | 2-1 | T-2 | T-1 | 0-0 | ND | T-1 | 1-1 | 0-0 | T-1 | T-1 | 0-0 |
| MS700-83 | 0-0 | T-1 | 1-4 | 3-2 | 0-0 | 2-1 | T-1 | 0-0 | 0-0 | ND | T-1 | 2-3 | T-5 | T-1 | 1-1 | 1-4 |
| MS704-10 | 0-0 | 0-0 | 1-4 | 0-0 | T-2 | 1-1 | 0-0 | 0-0 | 0-0 | ND | T-1 | 1-5 | 0-0 | T-1 | T-1 | 0-0 |
| MS716-15 | 1-3 | T-1 | 1-4 | 0-0 | 0-0 | 1-1 | T-1 | T-1 | T-3 | ND | T-1 | 1-5 | T-2 | T-1 | T-1 | 2-4 |
| G670-11 | NR | T-1 | 1-3 | 2-2 | T-1 | 2-1 | T-1 | 0-0 | 2-3 | ND | T-1 | 1-3 | T-3 | T-1 | T-1 | 2-3 |
| MN 11816 | 0-0 | T-1 | -- | 2-2 | 0-0 | 1-1 | T-1 | T-1 | 0-0 | ND | T-1 | 2-2 | 1-3 | 0-0 | T-1 | 0-0 |
| MN 11903 | 0-0 | T-1 | 1-3 | 3-2 | T-1 | 1-1 | 0-0 | T-1 | T-3 | ND | T-2 | 2-1 | 1-4 | T-1 | T-1 | 0-0 |
| NE 106 | 0-0 | T-1 | -- | 3-3 | T-3 | 2-1 | T-2 | NR | 5-2 | ND | 0-0 | 2-1 | T-1 | 3-4 | T-1 | 0-0 |
| BN9815-3 | 0-0 | T-1 | 1-4 | 0-0 | T-1 | 1-1 | 1-1 | NR | 2-3 | ND | T-3 | 1-2 | T-3 | T-1 | T-1 | 2-4 |
| ND671-4Russ | 0-0 | 0-0 | -- | 0-0 | 0-0 | 1-1 | 0-0 | T-1 | 1-3 | ND | T-2 | 1-1 | 0-0 | 0-0 | T-0 | 0-0 |
| W 842 | 0-0 | 1-1 | 1-3 | 2-1 | 0-0 | 2-1 | 0-0 | T-1 | T-2 | ND | T-1 | 3-5 | T-2 | T-1 | T-1 | 0-0 |
| W 903 | 0-0 | 1-1 | -- | 3-2 | 0-0 | 3-1 | T-1 | T-1 | 0-0 | ND | T-2 | 1-2 | 0-0 | T-1 | T-1 | 0-0 |
| W 949R | T-0 | T-1 | 1-3 | 2-2 | 0-0 | 2-1 | 0-0 | 0-0 | 0-0 | ND | T-3 | 1-5 | T-3 | T-1 | T-1 | 2-4 |
| Red Pontiac | 0-0 | 1-1 | -- | 3-3 | 0-0 | 3-1 | 0-0 | T-1 | 0-0 | ND | T-1 | 2-2 | 0-0 | 1-3 | T-1 | 0-0 |
| Russet Burbank | 0-0 | 0-0 | -- | 1-2 | 0-0 | 1-1 | 0-0 | 0-0 | 0-0 | ND | T-1 | 1-1 | 0-0 | 0-0 | T-1 | 0-0 |
| Norgold Russet | 0-0 | 0-0 | -- | 1-2 | 0-0 | 1-1 | 0-0 | T-1 | 0-0 | ND | T-1 | 1-1 | 0-0 | 0-0 | T-1 | 0-0 |
| Norchip | 0-0 | T-1 | -- | 2-1 | 0-0 | 2-1 | T-1 | 0-0 | 0-0 | ND | T-1 | 2-5 | 0-0 | T-1 | T-1 | 0-0 |

1/ AREA

TYPE

ND - No Data

NR - Not Received

1 = Small, superficial

2 = Larger, superficial

3 = Larger, rough pustules

4 = Larger pustules, shallow eyes

5 = Very large pustules, deep holes

T = less than 1%

1 = 1-20%

2 = 21-40%

3 = 41-60%

4 = 61-80%

North Central Regional Trial Table 7. Summary of Grade Defects - 1985.

| Cultivar or Selection | External | | | | Total Free of ^{1/} Ext. Defects | Internal | | | |
|--------------------------|----------|------------------|------------------|--------------|--|-----------------|----------------------|--------------------------------|----------------------------------|
| | Scab | Growth Cracks | Second Growth | Sun Green | | Hollow Heart | Internal Necrosis | Vascular Discolora- tion | Total Free of Int. Defects |
| Early to | | | | | | | | | |
| Medium Early | | | | | | | | | |
| Norland | 10.6 | 2.1 | 3.3 | 2.6 | 80.2 | 0.8 | 0.6 | 6.1 | 92.6 |
| Minn.11705 | 8.1 | 1.0 | 3.1 | 2.1 | 84.0 | 0.3 | 1.1 | 1.8 | 96.1 |
| NE 9.75-1 | 13.1* | 1.5 | 3.4 | 2.3 | 77.8 | 1.5 | 0.6 | 11.3* | 84.5 |
| ND651-9 | 15.6* | 4.6 | 4.4 | 2.7 | 73.7 | 0.5 | 0.6 | 5.8 | 93.3 |
| ND860-2 | 10.7 | 1.2 | 2.4 | 3.7 | 81.8 | 0.4 | 1.3 | 0.8 | 97.4 |
| Medium to Late | | | | | | | | | |
| La. 12-59 | 7.7 | 3.0 | 3.4 | 2.2 | 83.9 | 0.8 | 0.6 | 1.9 | 97.0 |
| La. 01-38 | 9.0 | 0.8 | 5.6 | 3.3 | 81.4 | 0.6 | 1.4 | 2.6 | 95.1 |
| MS 700-83 | 11.3* | 4.0 | 0.9 | 5.9 | 77.9 | 0.9 | 1.7 | 4.7 | 88.9 |
| MS 704-10 | 8.8 | 2.0 | 1.5 | 4.9 | 81.0 | 2.0 | 1.5 | 2.4 | 94.3 |
| MS 716-15 | 10.7* | 0.6 | 0.7 | 3.3 | 83.8 | 1.2 | 0.6 | 2.3 | 96.1 |
| G 670-11 | 13.2 | 4.3 | 4.3 | 7.9 | 71.3 | 7.3* | 2.2 | 5.9 | 85.1 |
| Minn. 11816 | 5.9 | 2.1 | 5.8 | 2.4 | 83.1 | 0.1 | 0.7 | 5.7 | 93.8 |
| Minn. 11903 | 7.3 | 0.4 | 2.7 | 1.6 | 86.8 | 0.0 | 1.4 | 5.4 | 94.0 |
| NE 106 | 22.3* | 5.1* | 2.7 | 0.6 | 69.5 | 6.3 | 4.1 | 8.5* | 80.2 |
| BN9815-3 | 10.4* | 1.0 | 4.6 | 6.4 | 75.1 | 11.3* | 2.8 | 6.5 | 81.4 |
| ND671-4Russ | 3.7 | 3.1 | 4.2 | 1.0 | 87.0 | 2.8 | 1.1 | 4.7 | 91.6 |
| W842 | 9.8 | 1.6 | 3.8 | 4.6 | 80.8 | 2.2 | 9.0* | 2.5 | 91.8 |
| W903 | 6.9 | 3.4 | 2.8 | 3.7 | 83.4 | 0.1 | 1.0 | 4.3 | 94.8 |
| W949R | 9.8 | 1.6 | 3.3 | 1.5 | 83.1 | 0.3 | 1.1 | 6.3 | 93.5 |
| Red Pontiac | 10.9* | 3.5 | 9.4 | 2.8 | 72.9 | 2.4 | 1.9 | 5.3 | 90.0 |
| Russet Burbank | 2.3 | 2.9 | 27.8* | 1.8 | 66.4 | 2.3 | 1.4 | 4.9 | 89.3 |
| Norgold Russet | 1.9 | 1.4 | 5.7 | 2.0 | 87.3 | 1.0 | 0.8 | 1.8 | 95.9 |
| Norchip | 8.5 | 4.8 | 10.4 | 6.5 | 72.6 | 1.5 | 3.6 | 8.8* | 86.8 |

^{1/} Percent normal tubers showing no defects (some individuals had more than one type of defect).

* Possible weakness of cultivar or clone.

North Central Regional Trial Table 8. Chip Quality - 1985

| Cultivar or Selection | Alb2/ | Man.2/ | CO1/ | KY2/ | LA1/ | MI1/ | MO2/ | NE1/ | OH2/ | ND2/ | WI1/ |
|------------------------------|-------|--------|------|------|------|------|------|------|------|------|------|
| <u>Early to Medium Early</u> | | | | | | | | | | | |
| Norland | 31 | 28 | 3.0 | 57 | 3.7 | 2.0 | 65 | 4.0 | 58.8 | 30 | 7.0 |
| MN 11705 | 36 | 38 | 3.0 | 55 | 3.1 | 1.0 | 68 | 2.0 | 56.4 | 43 | 5.5 |
| NE9.75-1 | 21 | 28 | 2.0 | 57 | NR | 1.5 | 68 | 4.0 | 51.2 | 45 | 4.5 |
| ND651-9 | 37 | 34 | 2.0 | 60 | 2.6 | 1.0 | 68 | 2.0 | 62.8 | 42 | 6.5 |
| ND860-2 | 63 | 47 | 1.5 | 57 | 3.0 | 1.0 | 71 | 3.0 | 61.1 | 46 | 3.3 |
| <u>Medium to Late</u> | | | | | | | | | | | |
| La. 12-59 | 19 | 25 | 1.5 | 48 | 2.7 | 2.0 | 70 | 3.0 | 59.8 | 26 | 6.0 |
| La. 01-38 | 22 | 27 | 2.5 | 58 | 2.4 | 2.0 | 70 | 4.0 | 58.1 | 39 | 5.5 |
| MS700-83 | 22 | 25 | 1.5 | 59 | 3.0 | 1.0 | 73 | 3.0 | 57.2 | 35 | 6.0 |
| MS704-10 | 26 | 28 | 2.5 | 53 | 3.9 | 1.5 | 64 | 3.0 | 62.3 | 36 | 8.0 |
| MS716-15 | 43 | 25 | 1.0 | 55 | 3.0 | 1.0 | 70 | 3.0 | 59.2 | 41 | 5.5 |
| G670-11 | NR | 24 | 2.0 | 55 | 2.7 | 2.0 | 71 | 5.0 | 53.3 | 32 | 6.0 |
| MN 11816 | 26 | 26 | ND | 58 | 2.9 | 2.0 | 70 | 5.0 | 56.2 | 33 | 7.0 |
| MN 11903 | 28 | 34 | 1.0 | 61 | 2.7 | 1.5 | 67 | 3.0 | 62.0 | 33 | 6.0 |
| NE 106 | 20 | 29 | ND | 52 | NR | 1.5 | 65 | 4.0 | 56.8 | 39 | 4.2 |
| BN9815-3 | 15 | 22 | 1.5 | 60 | NR | 2.0 | 68 | 3.0 | 57.0 | 27 | 5.5 |
| ND671-4Russ | 28 | 28 | ND | 56 | 2.7 | 3.5 | 65 | 4.0 | 53.4 | 32 | 6.0 |
| W 842 | 34 | 33 | 1.5 | 63 | 2.4 | 1.0 | 71 | 3.0 | 56.0 | 41 | 3.8 |
| W 903 | 24 | 26 | 1.0 | 60 | 2.0 | 2.0 | 68 | 5.0 | 52.2 | 38 | 6.0 |
| W 949R | 13 | 19 | ND | 58 | 3.4 | 3.0 | 73 | 4.0 | 45.8 | 26 | 9.0 |
| Red Pontiac | 15 | 18 | ND | 36 | 3.7 | 3.5 | 50 | 6.0 | 35.0 | 19 | 9.0 |
| Russet Burbank | 24 | 23 | ND | 58 | 6.0 | 3.0 | 63 | 5.0 | ND | 31 | 6.0 |
| Norgold Russet | 14 | 18 | ND | 34 | 4.3 | 3.5 | 60 | 6.0 | 23.2 | 27 | 9.0 |
| Norchip | 32 | 34 | 2.0 | 50 | 2.0 | 1.0 | 69 | 3.0 | 61.0 | 40 | 5.2 |

1/ PCII Color Chart (1 - lightest; 10 - darkest)

2/ Agtron (Highest number lightest)

NR - Not Received

ND - No Data

No data reported from Indiana, Iowa, Kansas, Minnesota, South Dakota

North Central Regional Trial Table 9. Early Blight^{1/} - 1985.

| Cultivar or Selection | Alb. | Man. | CO | IN | IA | KS | KY | LA | MI | MN | MO | NE | OH | ND | SD | WI | Ave. |
|--------------------------|------|------|----|----|----|-----|-----|----|-----|-----|----|----|----|-----|-----|-----|------|
| <u>Early to</u> | | | | | | | | | | | | | | | | | |
| <u>Medium Early</u> | | | | | | | | | | | | | | | | | |
| Norland | 2.0 | ND | ND | ND | ND | 3.0 | 1.0 | ND | DNA | 4.5 | ND | ND | ND | 1.0 | 5.0 | 3.0 | 2.8 |
| MN 11705 | 4.0 | ND | ND | ND | ND | 3.3 | 1.5 | ND | DNA | 5.0 | ND | ND | ND | 1.3 | 5.0 | ND | 3.4 |
| NE9.75-1 | 5.0 | ND | ND | ND | ND | 3.5 | 4.0 | ND | DNA | 2.5 | ND | ND | ND | 3.0 | 5.0 | 3.0 | 3.7 |
| ND651-9 | 5.0 | ND | ND | ND | ND | 3.3 | 3.0 | ND | DNA | 3.5 | ND | ND | ND | 1.3 | 5.0 | ND | 3.5 |
| ND860-2 | 4.0 | ND | ND | ND | ND | 4.0 | 2.3 | ND | DNA | 4.5 | ND | ND | ND | 1.0 | 5.0 | ND | 3.5 |
| <u>Medium to Late</u> | | | | | | | | | | | | | | | | | |
| La. 12-59 | 5.0 | ND | ND | ND | ND | 3.3 | 3.3 | ND | DNA | 3.0 | ND | ND | ND | 2.5 | 5.0 | ND | 3.7 |
| La. 01-38 | 5.0 | ND | ND | ND | ND | 4.3 | 5.0 | ND | DNA | 2.5 | ND | ND | ND | 2.8 | 5.0 | 3.0 | 3.9 |
| MS 700-83 | 5.0 | ND | ND | ND | ND | 4.0 | 3.0 | ND | DNA | 2.5 | ND | ND | ND | 2.5 | 5.0 | ND | 3.7 |
| MS 704-10 | 5.0 | ND | ND | ND | ND | 3.0 | 3.0 | ND | DNA | 3.0 | ND | ND | ND | 2.0 | 5.0 | 3.0 | 3.4 |
| MS 716-15 | 5.0 | ND | ND | ND | ND | 4.0 | 4.0 | ND | DNA | 2.0 | ND | ND | ND | 2.8 | 5.0 | 4.0 | 3.8 |
| G 670-11 | NR | ND | ND | ND | ND | 3.8 | 4.8 | ND | DNA | 1.5 | ND | ND | ND | 3.8 | 5.0 | 4.0 | 3.8 |
| MN1816 | 4.0 | ND | ND | ND | ND | 3.5 | 3.3 | ND | DNA | 3.0 | ND | ND | ND | 2.0 | 5.0 | 3.0 | 3.4 |
| MN11903 | 5.0 | ND | ND | ND | ND | 5.0 | 1.5 | ND | DNA | 4.0 | ND | ND | ND | 1.0 | 5.0 | 3.0 | 3.5 |
| NE 106 | 5.0 | ND | ND | ND | ND | 4.0 | 2.8 | ND | DNA | 1.5 | ND | ND | ND | 3.3 | 5.0 | 3.0 | 3.5 |
| EN9815-3 | 5.0 | ND | ND | ND | ND | 3.0 | 3.5 | ND | DNA | 2.0 | ND | ND | ND | 2.5 | 5.0 | ND | 3.5 |
| ND671-HRuss | 5.0 | ND | ND | ND | ND | 4.0 | 3.0 | ND | DNA | 3.5 | ND | ND | ND | 1.8 | 5.0 | ND | 3.7 |
| W242 | 5.0 | ND | ND | ND | ND | 4.0 | 5.0 | ND | DNA | 2.0 | ND | ND | ND | 3.0 | 5.0 | 3.0 | 3.9 |
| W903 | 5.0 | ND | ND | ND | ND | 4.0 | 3.0 | ND | DNA | 3.0 | ND | ND | ND | 2.5 | 5.0 | ND | 3.8 |
| W949R | 5.0 | ND | ND | ND | ND | 3.7 | 3.8 | ND | DNA | 3.0 | ND | ND | ND | 2.0 | 5.0 | 4.0 | 3.8 |
| Red Pontiac | 5.0 | ND | ND | ND | ND | 4.0 | 4.5 | ND | DNA | 2.5 | ND | ND | ND | 3.3 | 5.0 | 4.0 | 4.0 |
| Russet Burbank | 5.0 | ND | ND | ND | ND | 4.3 | 5.0 | ND | DNA | 1.5 | ND | ND | ND | 3.5 | 5.0 | ND | 4.1 |
| Norgold Russet | 5.0 | ND | ND | ND | ND | 4.0 | 1.8 | ND | DNA | 4.0 | ND | ND | ND | 1.0 | 5.0 | ND | 3.5 |
| Norchip | 5.0 | ND | ND | ND | ND | 4.3 | 2.8 | ND | DNA | 3.5 | ND | ND | ND | 2.3 | 5.0 | 3.0 | 3.7 |
| Average | 4.7 | | | | | 3.8 | 3.3 | | | 2.9 | | | | 2.3 | 5.0 | 3.3 | 3.6 |

^{1/} Early Blight: 1=susceptible; 5=highly resistant; 0=no disease
 ND - No Data; DNA - Data Not Available; NR - Selection Not Received

North Central Regional Trial Table 10. Merit Ratings 1/ - 1985

| Cultivar or Selection | Alb. | Man. | CO | IN | IA | KS | KY | LA | MI | MN | MO | NE | OH | ND | SD | WI | Total Points |
|--------------------------|------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----------------|
| <u>Early to</u> | | | | | | | | | | | | | | | | | |
| <u>Medium Early</u> | | | | | | | | | | | | | | | | | |
| Norland | 3 | 4 | | | | | | 4 | | | | 2 | | | | | 11 |
| MN11705 | | | | | | | | | | | | | | | | | 2 |
| NE9.75-1 | | | | | | | | | | | | | | | 3 | | 3 |
| ND651-9 | 4 | | | 4 | | 2 | | | | | 5 | 5 | | | 2 | | 22 |
| ND860-2 | | 3 | | | 3 | | 2 | 1 | | | | | 3 | | | | 12 |
| <u>Medium to Late</u> | | | | | | | | | | | | | | | | | |
| La. 12-59 | | 2 | 2 | 3 | | 4 | | | | 4 | | 1 | 4 | 3 | | 1 | 24 |
| La. 01-38 | | | 5 | | 5 | 3 | | 5 | 2 | 1 | | | 5 | 2 | | | 28 |
| MS700-83 | | | | | | | | 2 | 5 | | | 3 | | | • | | 10 |
| MS704-10 | | | | | | | 1 | | | 2 | | | | | | | 3 |
| MS716-15 | 1 | | | 5 | 4 | | 3 | | 4 | 5 | | | 1 | | | | 23 |
| G670-11 | | | 3 | 2 | | 5 | 5 | 3 | | | 4 | | | 5 | | | 27 |
| MN 11816 | | | | | 2 | | | | 3 | | | | | | | 5 | 10 |
| MN 11903 | | | | | | | | | | | | | | | | | 0 |
| NE 106 | | | | | | | | | | | | | | | | | 0 |
| EN9815-3 | | | | | | | | | | | | | 2 | | | | 2 |
| ND671-4Russ | | 1 | 4 | 1 | | | | | 1 | 3 | 1 | | | 5 | 1 | 2 | 19 |
| W 842 | | | 1 | | 1 | | | | | | 3 | | | | | 3 | 8 |
| W 903 | | | | | | | | | | | | | | | | | 0 |
| W 949R | | | | | | | | | | | | | | 1 | | 4 | 9 |
| Red Pontiac | | | | | | | | | | | | | | | | | 9 |
| Russet Burbank | | 5 | | | | | | | | | | | | 4 | | | 0 |
| Norgold Russet | 4 | | | | | 1 | | | | | | | | 4 | | | 9 |
| Norchip | 5 | | | | | | | | | | 2 | 4 | | | | | 11 |

1/ Merit Ratings

| Rating | Points |
|--------|--------|
| 1 | 5 |
| 2 | 4 |
| 3 | 3 |
| 4 | 2 |
| 5 | 1 |

WESTERN REGIONAL POTATO VARIETY TRIAL - 1985

J.J. Pavék, D.L. Corsini, and Cooperators 1/

Uniform Potato Yield Trial

The 1985 trial was grown uniformly at eleven locations. It consisted of 12 entries, 9 experimental and 3 standard checks. The data from New Mexico was not received in time to include here. Four locations grew all or some of the entries for early harvest. The trial locations, dates of planting, vine killing, and harvest, and days from planting to harvest were as follows:

| State | Location | Planting Date | Vine Kill Date | Harvest Date | Days to Harvest |
|------------|-----------------|---------------------------------|----------------|--------------|-----------------|
| California | Kern Co. | 2/19 | 6/18 | 6/24 | 125 |
| " | Tulelake | 5/7 | 9/4 | 9/25 | 141 |
| Colorado | San Luis Valley | 5/15 | 8/26 | 9/12 | 120 |
| Idaho | Aberdeen-Early | 5/1 | 8/14 | 8/16 | 114 |
| " | Aberdeen-Late | 5/8 | 9/12 | 10/3 | 148 |
| " | Kimberly | 4/30 | 9/13 | 10/4 | 157 |
| New Mexico | Farmington | 4/12 | | 10/1 | 152 |
| Oregon | Hermiston-Early | 3/28 | 7/22 | 8/2 | 127 |
| " | Hermiston-Late | 4/8 | 9/23 | 10/15 | 190 |
| " | Malheur-Early | 4/30 | 8/14 | 8/21 | 113 |
| " | Malheur-Late | 5/1 | 10/1 | 10/7 | 159 |
| Texas | Olton | 4/6 | 8/22 | 8/28 | 144 |
| Washington | Othello-Early | 4/11 | | 8/13 | 124 |
| | Othello-Late | 4/17 | | 9/30 | 166 |
| Wyoming | Torrington | Mid-Sept frost destroyed tubers | | | |

Cultural practices and the use of fertilizer, herbicides, pesticides, and vine killing varied according to local conditions. Trial plots at all locations were irrigated on a regular schedule throughout the entire growing season according to plant needs. April through July temperatures were from 1 to 3F above normal in the northern part of the region while August was about 3F below normal. The southern areas were about normal.

Data on vine and tuber characteristics, yield, internal quality disease reactions, and merit scores are presented in Western Tables 1 through 7. Of the experimental clones, high yielding, oblong non-russet A76147-2 had the highest merit score and long russet A7411-2 was second. This first clone, is a possible replacement for Kennebec in the Columbia Basin, while A7411-2 is similar to Russet Burbank but higher in solids. A7411-2, A74114-4, A76147-2, and TC582-1 will be repeated in this trial in 1986. Colorado will continue testing AC77513-1 and AC77652-1.

1/ California, R. Voss, C. Dennett; Colorado, D. Holm; Idaho, S. Love, G. Kleinschmidt; New Mexico, E.J. Gregory; Oregon, A. Mosley, D. Hane, C. Stanger; Washington, R. Thornton, W. Iritani, M. Martin, J. Rupp; Wyoming, K. Bohenblust.

Western Table 1. Seed source, stand, vine characteristics, and foliar diseases. 1/

| Entry | Seed Source | Stand % (9 loc) | Vine Size | Maturity | Wilt | | Early Blight | |
|----------------|-------------|--------------------|-----------|----------|------|----|--------------|----|
| | | | | | ID | WA | ID | WA |
| Full Season | | | | | | | | |
| A7411-2 | ID | 97 | MLrg | ML | MR | MS | MR | MR |
| A76147-2 | ID | 91 | MLrg | Med | MS | MR | MS | -- |
| AC77513-1 | CO | 82 | MLrg | ML | -- | S | -- | S |
| AC77652-1 | CO | 90 | Med | ME | S | VS | S | VS |
| TC582-1 | CO | 94 | Lrg | Late | R | - | R | - |
| Lemhi Russet | OR, ID | 95 | MLrg | ML | S | S | S | S |
| Russet Burbank | OR, ID | 94 | MLrg | ML | S | MS | S | MS |
| Early | | | | | | | | |
| A74114-4 | ID | 94 | Med | ME | S | VS | S | VS |
| ND534-4Rus | OR, ID | 70* | Med | ME | S | VS | S | VS |
| 78-LC1 | WA | 94 | MSm | E | S | S | S | S |
| NorKing Russet | OR, ID | 63* | Med | ME | S | VS | S | VS |
| Norgold Russet | OR, ID | 92 | Med | ME | S | VS | S | VS |

1/ M, Med = medium, Lrg = large, Sm = small, ML = medium large, ME = medium early, E = early.
 x Chemical injury in OR seed.

Western Table 2. Total tuber yield, cwt/acre. Full season and early harvests.^{1/}

| Entry | California | | Colo | | Idaho | | Oregon | | Texas | | Washington | | Overall Mean |
|----------------|------------|-----|------|--------------|-------|--------------|--------------|-----|--------------|-----|------------|-----|---------------------|
| | Krn | Tul | SLV | Ab | Kim | Hrm | Mal | Olt | Oth | Pro | Oth | Pro | |
| A7411-2 | --- | 580 | 323 | 411 | 396 | 662 | 627 | 295 | 651 | 480 | | | 509 b ^{2/} |
| A76147-2 | 1015 | 670 | 408 | 517 | 473 | 769 | 657 | 400 | 930 | 429 | | | 627 a |
| AC77513-1 | 540 | 415 | 288 | 310 | 356 | 578 | --- | 333 | 549 | 203 | | | 402 c |
| AC77652-1 | 510 | 305 | 214 | 258 | 306 | 684 | 528 | 319 | 670 | 325 | | | 402 c |
| TC582-1 | 570 | 370 | 334 | 418 | 411 | 386 | --- | 302 | 507 | 136 | | | 387 c |
| Lemhi Russet | 758 | 565 | 326 | 365 (217) | 416 | 611 (295) | 442 (308) | 447 | 594 (852) | 442 | | | 499 b |
| Russet Burbank | 710 | 505 | 301 | 347 (220) | 348 | 726 (298) | 468 (492) | 391 | 754 (810) | 387 | | | 494 b |
| A74114-4 | 475 | 535 | 249 | 302 (240) | 392 | 747 (495) | 447 (311) | 236 | --- | 388 | | | 431 bc |
| ND534-4Rus | 420 | 495 | 207 | --- | --- | 696 (283) | --- | 202 | --- | 249 | | | 383 c |
| 78-LC1 | --- | 430 | 268 | --- | --- | 745 (389) | 615 (431) | 127 | --- | --- | | | 441 bc |
| NorKing Russet | 510 | 370 | 265 | 287 (282) | 289 | 499 (288) | 627 (334) | 207 | --- | 350 | | | 392 c |
| Norgold Russet | 515 | 480 | 310 | --- | --- | 731 (363) | --- | 226 | --- | 446 | | | 458 bc |
| Location Means | 609 | 477 | 291 | 352 | 370 | 653 | 522 | 290 | 618 | 339 | | | 452 |

^{1/} Early harvest values are shown in parentheses ().

^{2/} Locations used as replications for Duncan's test (P=0.05)

Western Table 3. U.S. No. 1's; percent of total yield for locations; overall mean, percent and cwt/acre. 1/

| Entry | California | | Colo | | Idaho | | Oregon | | Texas | | Washington | | Mean | |
|----------------|------------|-----|------|--|-------|-----|--------|------|-------|--|------------|-----|------|--------|
| | Krn | Tul | SLV | | Ab | Kim | Hrm | Mal | Olt | | Oth | Pro | % | cwt/A |
| A7411-2 | -- | 89 | 85 | | 91 | 81 | 80 | 80 | 77 | | 83 | 64 | 81 | 421 b |
| A76147-2 | 89 | 87 | 90 | | 88 | 69 | 76 | 79 | 76 | | 87 | 62 | 80 | 511 a |
| AC77513-1 | 88 | 90 | 73 | | 81 | 90 | 89 | -- | 45 | | 79 | 56 | 77 | 320 c |
| AC77652-1 | 95 | 87 | 76 | | 85 | 78 | 86 | 83 | 44 | | 79 | 60 | 77 | 320 c |
| TC582-1 | 95 | 70 | 77 | | 71 | 87 | 95 | -- | 91 | | 74 | 44 | 85 | 315 c |
| Lemhi Russet | 94 | 96 | 80 | | 79 | 90 | 92 | 88 | 65 | | 84 | 64 | 83 | 422 b |
| | | | | | (65) | | (77) | (69) | | | (91) | | | |
| Russet Burbank | 76 | 90 | 55 | | 67 | 48 | 67 | 73 | 57 | | 76 | 38 | 65 | 333 c |
| | | | | | (59) | | (56) | (70) | | | (91) | | | |
| A74114-4 | 97 | 93 | 84 | | 79 | 75 | 93 | 90 | 64 | | -- | 60 | 82 | 364 bc |
| | | | | | (81) | | (74) | (83) | | | (92) | | | |
| ND534-4Rus | 93 | 90 | 79 | | -- | -- | 85 | -- | 50 | | -- | 52 | 75 | 308 c |
| | | | | | (78) | | (80) | (83) | | | (91) | | | |
| 78-LC1 | -- | 86 | 75 | | -- | -- | 84 | 66 | 17 | | -- | -- | 66 | 329 c |
| | | | | | (74) | | (84) | (80) | | | (91) | | | |
| NorKing Russet | 92 | 89 | 96 | | 80 | 85 | 87 | 80 | 47 | | -- | 58 | 78 | 316 c |
| | | | | | (82) | | (80) | (88) | | | (91) | | | |
| Norgold Russet | 96 | 94 | 76 | | -- | -- | 83 | -- | 34 | | -- | 52 | 72 | 355 c |
| | | | | | (86) | | (84) | (34) | | | (78) | | | |
| Location Means | 92 | 90 | 78 | | 81 | 78 | 84 | 80 | 53 | | 80 | 56 | 76 | 360 |

1/ See Western Table 2 footnotes.

Western Table 4. U.S. NO. 1's over 10 oz, percent of total yield for locations; overall mean, percent, and cwt/acre. $\frac{1}{\text{acre}}$

| Entry | California | | Colo | | Idaho | | Oregon | | Texas | | Wash | | Mean % cwt/A |
|----------------|------------|-----|------|------|-------|------|--------|-----|-------|--|------|--|-----------------|
| | Krn | Tul | SLV | Ab | Kim | Hrm | Mal | Olt | Oth | | | | |
| A7411-2 | -- | 44 | 13 | 64 | 60 | 58 | 26 | 73 | 63 | | | | 50 250 b |
| A76147-2 | 65 | 40 | 45 | 64 | 45 | 47 | 37 | 73 | 76 | | | | 55 362 a |
| AC77513-1 | 52 | 30 | 9 | 41 | 59 | 56 | -- | 41 | 58 | | | | 43 191 bcd |
| AC77652-1 | 20 | 25 | 8 | 32 | 29 | 54 | 40 | 39 | 59 | | | | 34 163 cd |
| TC582-1 | 30 | 9 | 16 | 41 | 46 | 20 | -- | 52 | 38 | | | | 32 129 d |
| Lemhi Russet | 32 | 28 | 16 | 42 | 67 | 51 | 32 | 60 | 62 | | | | 43 219 bc |
| | | | | (23) | | (8) | (7) | | (46) | | | | |
| Russet Burbank | 27 | 36 | 3 | 35 | 23 | 28 | 12 | 54 | 53 | | | | 30 161 cd |
| | | | | (35) | | (7) | (10) | | (38) | | | | |
| A74114-4 | 32 | 49 | 20 | 50 | 36 | 65 | 50 | 58 | -- | | | | 40 216 bc |
| | | | | (35) | | (47) | (32) | | (60) | | | | |
| ND534-4Rus | 32 | 38 | 16 | -- | -- | 57 | -- | 44 | -- | | | | 37 176 cd |
| | | | | (19) | | (31) | (37) | | (38) | | | | |
| 78-LC1 | -- | 16 | 6 | -- | -- | 47 | 23 | 9 | -- | | | | 20 127 d |
| | | | | (11) | | (17) | (22) | | (42) | | | | |
| NorKing Russet | 38 | 27 | 15 | 38 | 41 | 64 | 26 | 38 | -- | | | | 36 154 cd |
| | | | | (28) | | (25) | (32) | | (45) | | | | |
| Norgold Russet | 19 | 33 | 11 | -- | -- | 56 | -- | 31 | -- | | | | 30 162 cd |
| | | | | (24) | | (13) | (26) | | (33) | | | | |
| Location Means | 35 | 30 | 15 | 45 | 45 | 50 | 31 | 48 | 58 | | | | 38 192 |

1/ See Western Table 2 footnotes.

Western Table 5. Specific gravity of tubers. ^{1/}

| Entry | California | | Colo | Idaho | | Oregon | | Texas | | Washington | | Overall |
|----------------|------------|-------|-------|------------|-------|------------|------------|-------|------------|------------|----------|---------|
| | Krn | Tul | SLV | Ab | Kim | Hrm | Mal | Olt | Oth | Pro | Mean | |
| A7411-2 | -- | -- | 1.094 | 1.088 | 1.090 | 1.087 | 1.105 | 1.074 | 1.070 | 1.076 | 1.083 bc | |
| A76147-2 | 1.076 | 1.076 | 102 | 85 | 85 | 69 | 88 | 61 | 70 | 73 | 77 d | |
| AC77513-1 | 80 | 86 | 94 | 80 | 84 | 84 | -- | 69 | 75 | 66 | 80 cd | |
| AC77652-1 | 69 | 82 | 80 | 76 | 77 | 68 | 80 | 56 | 61 | 56 | 69 e | |
| TC582-1 | 91 | 88 | 104 | 86 | 85 | 88 | -- | 78 | 85 | 76 | 87 a | |
| Lemhi Russet | 84 | 87 | 99 | 80 (75) | 84 | 90 (72) | 94 (90) | 77 | 78 (90) | 74 | 84 ab | |
| Russet Bubank | 78 | 84 | 90 | 77 (74) | 83 | 77 (69) | 81 (87) | 72 | 74 (82) | 70 | 78 d | |
| A74114-4 | 81 | 83 | 100 | 79 (75) | 85 | 79 (71) | 91 (83) | 58 | -- (82) | 70 | 79 d | |
| ND534-4Rus | 75 | 73 | 83 | -- (74) | -- | 64 (69) | -- (76) | 64 | -- (74) | 60 | 70 e | |
| 78-LC1 | -- | -- | 87 | -- (77) | -- | 68 (72) | -- (82) | 58 | -- (81) | -- | 71 e | |
| NorKing Russet | 82 | 81 | 92 | 81 (82) | 83 | 69 (73) | -- (86) | 63 | -- (80) | 71 | 77 d | |
| Norgold Russet | 76 | 75 | 83 | -- (73) | -- | 68 (70) | -- (79) | 63 | -- (71) | 69 | 72 e | |
| Location Mean | 1.079 | 1.081 | 1.092 | 1.079 | 1.082 | 1.076 | -- | 1.066 | 1.072 | 1.069 | 1.077 | |

^{1/} See Western Table 2 footnotes.

Western Table 6. External and internal defects, french fry color, and sugars.

| Entry | U.S. No.2 & Culls >4 oz | Common Scab (Ab) | Internal Necrosis % 1/ | Hollow heart % | Black- spot 2/ | Fry Color | | Sugars % | |
|----------------|-------------------------------|------------------------|------------------------------|----------------------|----------------------|-----------|-----------|------------------|------|
| | | | | | | ID 450 | OR 450 | ID (DWB) Tot. | Red. |
| A7411-2 | 18 | S | 18 | 0 | 1.8 | 1.5 | 1.1 | 1.7 | 0.9 |
| A76147-2 | 20 | MS | 20 | 4 | 2.4 | 1.1 | 2.1 | 1.6 | 0.6 |
| AC77513-1 | 23 | -- | 1 | 25 | 1.0 | 2.8 | 2.8 | 3.2 | 2.0 |
| AC77652-1 | 24 | S | 4 | 25 | 1.6 | 2.5 | 2.9 | 2.6 | 1.8 |
| TC582-1 | 23 | VR | 7 | 7 | 2.4 | 2.0 | 0.2 | 2.3 | 1.1 |
| Lemhi Russet | 19 | R | 3 | 12 | 3.4 | 1.8 | 0.2 | 1.5 | 0.7 |
| Russet Bubank | 36 | R | 13 | 4 | 1.9 | 1.9 | 1.1 | 2.4 | 1.4 |
| A74114-4 | 19 | MS | 8 | 7 | 1.5 | 2.3 | 2.8 | -- | -- |
| ND534-4Rus | 27 | MS | 13 | 4 | -- | -- | 2.7 | -- | -- |
| 78-LC1 | 34 | R | 1 | 1 | -- | -- | 2.8 | -- | -- |
| NorKing Russet | 23 | VR | 30 | 9 | 1.8 | -- | 2.8 | 2.3 | 1.3 |
| Norgold Russet | 30 | R | 5 | 4 | -- | -- | 2.6 | -- | -- |

1/ Mean of 4 locations (Tul, Oth, Olt, Pro).

2/ Mean of 4 locations (Both California & Idaho locations), 1.0 (lightest) to 5.0 (darkest).

3/ French fry color: USDA standard chart, 0.1 (lightest) to 4.0 (darkest).

Western Table 7. Tuber type and merit rating scores. 2/

| Entry | Tubers ^{1/} | | California | | Colo | Idaho | | Oregon | | Texas | | Washington | | Total Merit Score |
|----------------|----------------------|------|------------|-----|------|-------|---|--------|-----|-------|-----|------------|-----|-------------------------|
| | Shape | Skin | Krn | Tul | SLV | Ab | L | Kim | Hrm | Mal | Olt | Oth | Pro | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| A7411-2 | L | Rus | - | - | 2 | - | 4 | 3 | 5 | - | - | 3 | 5 | 22 |
| A76147-2 | O | Wt | - | 4 | 5 | 1 | 3 | 2 | - | 1 | 2 | 5 | 3 | 26 |
| AC77513-1 | O | Rus | - | - | - | - | - | - | - | - | - | 1 | - | 1 |
| AC77652-1 | O | Rus | 4 | - | - | - | - | - | - | - | 3 | - | - | 7 |
| TC582-1 | O | Rus | 2 | - | 4 | - | 1 | 1 | 1 | - | 4 | - | - | 13 |
| Lemhi Russet | L-O | Rus | 3 | - | 3 | - | 5 | 4 | 4 | - | 5 | 2 | 4 | 30 |
| Russet Bubank | L | Rus | - | 3 | - | - | - | - | 2 | - | - | 4 | - | 9 |
| A74114-4 | O-L | Rus | - | 2 | - | 2 | 2 | 5 | 3 | 2 | - | - | 2 | 18 |
| ND534-4Rus | L | Rus | 1 | 1 | - | - | - | - | - | - | - | - | - | 2 |
| 78-LC1 | O | Rus | - | - | - | 4 | - | - | - | 4 | - | - | 1 | 9 |
| NorKing Russet | O | Rus | 5 | - | - | 5 | - | - | - | 3 | 1 | - | - | 14 |
| Norgold Russet | O | Rus | - | 5 | 1 | 3 | - | - | - | 5 | - | - | - | 14 |

1/ Shape: O=oblong, L=long, R=round; Skin: Rus=russet; wt=white, non-russet.

2/ Merit Rating: Rank Score

| | |
|---|---|
| 1 | 5 |
| 2 | 4 |
| 3 | 3 |
| 4 | 2 |
| 5 | 1 |

COLORADO

D. G. Holm and M. K. Thornton

Breeding Program

Characteristics being emphasized in the Colorado program are yield, specific gravity, russeting, and fresh market/processing qualities. Thirty-one parental clones were intercrossed in 1985. Seeds from 258 combinations were obtained. Sixty seedling families were grown in the greenhouse, producing 11,795 tubers for initial selection in 1986.

Seedling tubers were obtained from Dr. R. E. Webb, Beltsville, Maryland; Dr. J. J. Pavek, Aberdeen, Idaho; Dr. R. E. Voss, Davis, California; and Dr. J. Creighton Miller, Lubbock, Texas. The California seedlings were produced from true seed obtained from Colorado.

Selection Program

A total of 58,169 first-year seedlings were planted, with 672 being selected for further observation. Another 714 clones were in various stages of preliminary and intermediate testing. One hundred nineteen of these clones were saved for further evaluation. Nine advanced selections were saved for increase and continued evaluation. Another 93 potato clones are being maintained for breeding or other experimental purposes.

Advanced Yield Trial. Eighteen entries, 13 advanced selections and five cultivars were planted in the advanced yield trial. Data collected on yield, grade, specific gravity, stand, vine maturity, tuber shape and skin type are presented in Table 1.

Russet selections showing the most promise and meriting further testing are: AC79100-1, AC79128-1, C07916-3 and WNC567-1.

White selections showing promise and meriting further testing are BR7093-24 and TXA17-1.

Chipping and Processing Studies. Five selections and two standard cultivars were tested at harvest and after various storage regimes for chipping potential. Specific gravity was determined at harvest. This data is summarized in Table 2.

None of the clones chipped satisfactorily directly out of 40° F storage or with reconditioning at 70° F for two weeks. AC80545-1, BR7093-24, C08014-2, Atlantic and Norchip produced acceptable chips under most other storage regimes, however.

Twenty-one clones in our program were evaluated for chipping potential by Clover Club Foods Company (Table 3). Numbered clones chipping satisfactorily throughout the test period were AC80545-1 and C081103-2. Both clones had better chip color than Atlantic and Norchip.

Two other clones, WNC521-12 and WNC672-2, were tested in the National Chipping Trials sponsored by the Potato Chip/Snack Food Association. Both of these clones will be reevaluated in 1986. Results of these tests will determine the status of these clones.

Twenty-nine clones were evaluated for specific gravity, fry color and mealiness. Samples were harvested September 3-4 and stored at 55° F until October 16. At that time, specific gravity, fry color, and mealiness were evaluated. The remaining portion of the sample was stored at 45° F until December 30 when fry color and mealiness were again rated. This data is summarized in Table 4. Specific gravity ranged from 1.109 to 1.076. C08014-2 exhibited the highest specific gravity, while AC8024-5 had the lowest. Seventeen clones had a higher specific gravity than Russet Burbank. Nine clones fried as good as or better than Russet Burbank. Clones with better fry color were: AC77226-10, AC80369-1, AC80545-1, C07920-3, and TC582-1. Four clones, AC80545-1, C07920-3, C08014-2 and TC582-1 received mealiness ratings equivalent to or greater than Russet Burbank.

Sangre Selection Studies. Seventeen line selections of Sangre were made from our tuber-unit seed lot in 1982. Seven selections were made for typical vine and 10 for larger vines. Progeny rows of each selection were grown for observational purposes in 1983. In 1984 and 1985 comparative performance trials were conducted. Data were collected on yield, grade, stand, plant height, and vine maturity. Results of the 1985 study are presented in Table 5.

Clones 10, 11 and 14 have had greater total and U. S. No. 1 yields than the standard clone for two years. These clones are slightly less vigorous early in the season, have taller vines, and are later maturing than the standard. A seed increase has been initiated on each of these selections and will be tested in other areas of the Western United States.

Grower Tests. Two russet selections, TC582-1 and WNC567-1, were released for grower testing in 1985. Both selections will be retested in 1986. Each selection was compared to Centennial Russet and Russet Burbank for seven characteristics by the growers. These characteristics were: Stand, emergence uniformity, vine vigor, tuber type, tuber size, uniformity of tuber size, grade defects, and skin set at harvest. Both selections received good to excellent ratings for most characteristics.

Two additional clones, AC77513-1 and AC77652-1, will be available for grower evaluation in 1986. Performance data for these clones, in addition to TC582-1 and WNC567-1, is summarized in Table 6.

New Potato Cultivar. The naming and release notice for WNC285-18 was submitted for approval in January of 1986. The name selected for WNC285-18 was Ute Russet.

Colorado Table 1. Yield, grade, specific gravity, stand, vine maturity, tuber shape and skin type for advanced yield trial clones.

| Clone | Yield (Cwt/A) | | | | | | | Stand | Vine Maturity ¹ | Specific Gravity | Tuber Shape ² & Skin Type |
|-------------------|---------------|-------|-------|--------|-------|---------|-----------------|-------|----------------------------|------------------|--------------------------------------|
| | Total | Total | US #1 | | US#2 | | | | | | |
| | | | % | >10 oz | <4 oz | & Culls | | | | | |
| A70369-2 | 401 | 247 | 61.7 | 43 | 136 | 17 | 100 | 2.0 | 1.097 | Ob,W | |
| AC77149-2 | 209 | 137 | 65.6 | 33 | 67 | 5 | 99 | 2.3 | 1.081 | Ob-L,R | |
| AC79100-1 | 392 | 307 | 78.2 | 86 | 66 | 19 | 99 | 4.0 | 1.096 | L-Ob,R | |
| AC79128-1 | 430 | 310 | 71.7 | 95 | 88 | 32 | 98 | 3.0 | 1.081 | Ob,R | |
| BC9668-1 | 215 | 126 | 58.0 | 15 | 85 | 4 | 99 | 1.8 | 1.081 | Ob-L,R | |
| BR7093-24 | 382 | 290 | 76.1 | 33 | 81 | 12 | 99 | 3.0 | 1.106 | R,W | |
| CO7913-1 | 280 | 175 | 62.4 | 34 | 66 | 38 | 99 | 2.0 | 1.078 | Ob-L,R | |
| CO7916-3 | 327 | 282 | 86.3 | 80 | 32 | 13 | 99 | 4.3 | 1.109 | Ob,R | |
| CO7920-3 | 252 | 219 | 87.0 | 86 | 27 | 5 | 99 | 4.3 | 1.100 | Ob-L,R | |
| CO7922-1 | 270 | 200 | 73.7 | 52 | 54 | 16 | 96 | 3.3 | 1.090 | Ob,R | |
| TXA17-1 | 415 | 350 | 84.4 | 94 | 46 | 19 | 98 | 2.5 | 1.090 | R,W | |
| WNC285-18 | 248 | 173 | 69.6 | 30 | 62 | 13 | 99 | 3.5 | 1.089 | Ob,R | |
| WNC567-1 | 274 | 193 | 70.3 | 34 | 69 | 12 | 97 | 2.8 | 1.086 | Ob,R | |
| Centennial Russet | 216 | 134 | 61.9 | 17 | 79 | 2 | 99 | 3.0 | 1.089 | Ob,R | |
| Nemarus | 242 | 157 | 64.8 | 27 | 73 | 12 | 96 | 3.3 | 1.085 | L,R | |
| Nooksack | 261 | 223 | 85.3 | 87 | 24 | 14 | 98 | 4.3 | 1.102 | Ob,R | |
| Norchip | 362 | 215 | 59.0 | 19 | 130 | 17 | 98 | 1.8 | 1.088 | Ob-R,W | |
| Russet Burbank | 316 | 163 | 51.4 | 27 | 143 | 11 | 99 | 2.3 | 1.086 | L,R | |
| Mean | 305 | 217 | 70.4 | 49 | 74 | 14 | 98 | 2.9 | 1.091 | | |
| LSD(0.05) | 43 | 42 | 7.8 | 30 | 20 | 14 | NS ³ | 0.6 | | | |

¹/Vine maturity is based on the amount of dead foliage on August 31: 1 = Very Early; 2 = Early; 3 = Medium; 4 = Late; 5 = Very Late.

²/Tuber Shape: R = Round; OV = Oval; Ob = Oblong; L = Long

Skin Type: R = Russet; W = White

³/Not significant

Colorado Table 2. Color of chipping study entries.

| Clone | At Harvest | 3 wks 70° F | 10 wks 40° F | 10 wks 50° F | 2 wks/70° F | | Specific Gravity |
|-----------|------------|----------------|-----------------|-----------------|--------------|--------------|------------------|
| | | | | | 10 wks/40° F | 10 wks/50° F | |
| A70369-2 | 3.0 | 2.5 | 4.5 | 2.0 | 4.0 | 2.0 | 1.092 |
| AC80545-1 | 1.0 | 2.0 | 4.0 | 1.5 | 3.5 | 1.0 | 1.096 |
| BR7093-24 | 2.0 | 3.0 | 4.5 | 1.0 | 4.0 | 1.5 | 1.094 |
| CO8014-2 | 2.0 | 2.5 | 5.0 | 2.0 | 3.5 | 1.5 | 1.108 |
| TXA17-1 | 3.0 | 4.0 | 4.5 | 2.5 | 3.5 | 1.5 | 1.086 |
| Atlantic | 1.5 | 2.0 | 5.0 | 2.5 | 2.5 | 1.0 | 1.104 |
| Norchip | 2.0 | 3.0 | 5.0 | 1.0 | 3.5 | 1.5 | 1.084 |

^{1/} Chip color was rated using the Potato Chip/Snack Food Association 1-5 scale. Ratings of 2.0 or less are acceptable.

Colorado Table 3. Chip color evaluations - Clover Club Foods Company¹

| Clone | Tuber Type | Specific Gravity | Chip Color ² | | |
|------------|------------|------------------|-------------------------|---------------------|---------------------------|
| | | | Oct 1 ³ | Jan 15 ⁴ | Recond 4 wks ⁵ |
| Atlantic | White | 1.107 | 1.0 | 4.5 | 4.5 |
| TXA17-1 | White | 1.093 | 1.0 | 6.5 | 4.0 |
| AC80545-1 | White | 1.098 | 1.0 | 4.0 | 3.5 |
| BR7093-24 | White | 1.100 | 1.0 | 5.0 | 4.5 |
| A70369-2 | White | 1.095 | 1.5 | 6.0 | 5.0 |
| Norchip | White | 1.085 | 1.5 | 5.0 | 4.5 |
| AC80369-1 | Russ | 1.097 | 1.5 | 6.0 | 4.5 |
| CO8014-2 | Russ | 1.109 | 2.0 | 7.0 | - |
| CO7918-15 | White | 1.084 | 2.0 | 4.5 | 6.0 |
| CO81103-1 | White | 1.105 | 2.0 | 4.0 | 5.0 |
| CO81103-2 | White | 1.118 | 2.5 | 3.0 | 4.0 |
| AC77226-10 | Russ | 1.086 | 3.0 | 9.0 | 7.0 |
| CO7917-16 | White | 1.104 | 3.0 | 9.5 | 8.0 |
| AC77101-1 | Russ | 1.089 | 3.0 | 9.0 | 6.5 |
| AC77226-13 | Russ | 1.086 | 3.5 | 10.0 | 9.0 |
| AC79100-1 | Russ | 1.093 | 4.0 | 6.0 | 6.5 |
| AC8024-5 | Russ | 1.084 | 4.0 | 10.0 | 9.0 |
| CO8128-1 | Russ | 1.097 | 4.0 | 8.0 | 7.0 |
| AC80363-1 | Russ | 1.098 | 4.5 | 10.0 | 6.0 |
| BC0038-1 | White | 1.096 | 5.0 | - | 6.0 |
| AC77669-1 | Russ | 1.077 | 6.0 | - | 9.0 |

^{1/} Data collected by Larry Anderson.

^{2/} Color was rated using the PCII 1-10 scale. Ratings of 1-4 acceptable, 5 marginal.

^{3/} Potatoes were harvested September 2-4 and held at room temperature until October 1.

^{4/} Stored at 50° F and then cooled to 37° F when the main body of the potatoes were removed from the storage 3-1/2 weeks before frying.

^{5/} Reconditioned at 62-64° F.

Colorado Table 4. Tuber shape, skin type, specific gravity, fry color and mealiness ratings for twenty-nine potato clones in 1985.

| Clone | Tuber Shape ¹ & Skin Type | Specific Gravity | Fry Color ² | | Mealiness ³ | |
|-------------------|---|---------------------|------------------------|--------|------------------------|--------|
| | | | Oct 16 | Dec 30 | Oct 16 | Dec 30 |
| A72685-2 | Ob,R | 1.088 | 2.0 | 2.0 | 1 | 2 |
| A74133-1 | Ob,R | 1.081 | 2.5 | 1.5 | 3 | 3 |
| A74212-1 | L,R | 1.087 | 3.5 | 2.0 | 2 | 2 |
| AC77101-1 | Ob,R | 1.085 | 3.0 | 2.0 | 2 | 2 |
| AC77226-10 | Ob,R | 1.084 | 4.5 | 4.0 | 1 | 1 |
| AC77226-13 | Ob,R | 1.087 | 4.0 | 3.0 | 3 | 3 |
| AC77513-1 | L,R | 1.089 | 2.0 | 2.5 | 3 | 3 |
| AC77652-1 | Ob,R | 1.082 | 1.5 | 1.0 | 3 | 4 |
| AC77669-1 | Ob,R | 1.077 | 1.5 | 1.0 | 1 | 3 |
| AC79100-1 | L,R | 1.089 | 3.0 | 3.0 | 3 | 3 |
| AC79128-1 | Ob-L,R | 1.081 | 4.0 | 3.5 | 2 | 2 |
| AC8024-5 | Ob-L,R | 1.076 | 3.5 | 2.0 | 2 | 4 |
| AC80363-1 | Ob-L,R | 1.089 | 2.5 | 2.0 | 4 | 2 |
| AC80369-1 | Ob,R | 1.092 | 4.5 | 4.5 | 2 | 3 |
| AC80545-1 | R,W | 1.097 | 4.5 | 4.5 | 4 | 4 |
| BC0038-1 | L,W | 1.095 | 2.5 | 2.5 | 4 | 3 |
| BC9668-1 | L,R | 1.079 | 2.5 | 2.5 | 1 | 3 |
| CO7913-1 | Ob-L,R | 1.079 | 2.0 | 2.0 | 3 | 4 |
| CO7916-3 | Ob,R | 1.099 | 1.0 | 1.0 | 4 | 3 |
| CO7920-3 | Ob-L,R | 1.102 | 4.5 | 4.0 | 5 | 4 |
| CO7922-1 | L,R | 1.089 | 2.5 | 3.0 | 2 | 2 |
| CO8011-5 | Ob,R | 1.081 | 3.0 | 1.5 | 3 | 2 |
| CO8014-2 | Ob,R | 1.109 | 4.0 | 4.0 | 5 | 5 |
| CO8048-1 | Ob,R | 1.087 | 4.0 | 3.5 | 2 | 3 |
| TC582-1 | Ob,R | 1.104 | 4.5 | 4.0 | 5 | 5 |
| WNC285-18 | Ob-L,R | 1.086 | 1.5 | 1.0 | 2 | 2 |
| WNC567-1 | L,R | 1.081 | 1.0 | 1.0 | 3 | 2 |
| Centennial Russet | Ob,R | 1.083 | 1.5 | 2.0 | 3 | 2 |
| Russet Burbank | L,R | 1.084 | 4.0 | 3.5 | 4 | 4 |

^{1/} Tuber Shape: R = Round; Ob = Oblong; L = Long.
Skin Type: R = Russet; W = White

^{2/} Fry color was rated on a 1-5 scale. Ratings of 3 or above are acceptable.

^{3/} Mealiness was rated on a 1-5 scale. A rating of 5 indicates the cooked flesh is dry, with 1 representing a wet texture.

Colorado Table 5. Yield, grade, stand, plant height and vine maturity of 18 Sangre clones.

| Clone | Yield | | | Grade | | Stand | Plant Height | | Vine Maturity ¹ |
|-----------------|-------|-------|------|--------|-------|-----------------|---------------|------|----------------------------|
| | Total | Total | % | >10 oz | <4 oz | | US #2 & Culls | (cm) | |
| 1 | 340 | 286 | 84.3 | 39 | 54 | 98 | 0 | 50 | 2.3 |
| 2 | 362 | 286 | 78.7 | 45 | 70 | 98 | 6 | 48 | 2.0 |
| 3 | 361 | 281 | 78.0 | 44 | 74 | 98 | 6 | 46 | 2.5 |
| 4 | 378 | 313 | 82.9 | 40 | 62 | 96 | 3 | 52 | 2.3 |
| 5 | 370 | 295 | 79.7 | 50 | 71 | 97 | 4 | 51 | 2.3 |
| 6 | 360 | 292 | 80.9 | 100 | 26 | 99 | 43 | 88 | 5.0 |
| 7 | 309 | 247 | 80.0 | 35 | 50 | 99 | 12 | 81 | 4.0 |
| 8 | 419 | 361 | 86.3 | 67 | 47 | 99 | 10 | 64 | 3.0 |
| 9 | 361 | 305 | 84.1 | 70 | 43 | 98 | 13 | 86 | 4.5 |
| 10 | 451 | 396 | 87.8 | 83 | 48 | 100 | 7 | 66 | 3.5 |
| 11 | 423 | 363 | 85.8 | 75 | 55 | 100 | 5 | 67 | 3.0 |
| 12 | 408 | 354 | 86.6 | 74 | 48 | 98 | 7 | 67 | 3.0 |
| 13 | 336 | 286 | 84.9 | 77 | 37 | 97 | 14 | 82 | 4.3 |
| 14 | 421 | 378 | 89.6 | 100 | 35 | 99 | 9 | 62 | 3.3 |
| 15 | 370 | 306 | 82.6 | 36 | 59 | 99 | 6 | 64 | 3.0 |
| 16 | 438 | 365 | 83.3 | 59 | 70 | 99 | 3 | 50 | 2.0 |
| 17 | 391 | 303 | 77.4 | 30 | 79 | 99 | 9 | 50 | 2.3 |
| 18 ² | 358 | 291 | 81.2 | 31 | 60 | 100 | 7 | 50 | 2.3 |
| Mean | 381 | 317 | 83.0 | 58 | 55 | 98 | 9 | 62 | 3.0 |
| LSD(0.05) | 56 | 52 | 4.4 | 38 | 17 | NS ³ | 9 | 5 | 0.5 |

¹/Vine maturity is based on the amount of dead foliage on August 31: 1 = Very Early; 2 = Early; 3 = Medium; 4 = Late; 5 = Very Late.

²/Clone 18 is the standard Sangre produced at the San Luis Valley Research Center.

³/Not significant.

Colorado Table 6. Comparison of advanced numbered selections with Centennial Russet and Russet Burbank for yield and grade.

| Clone | No. of Tests | Yield (Cwt/A) | | % US #1 | % External Defects ¹ | % Hollow Heart ² |
|-------------------|--------------|---------------|-------|---------|---------------------------------|-----------------------------|
| | | Total | US #1 | | | |
| AC77513-1 | 3 | 347 | 265 | 76.0 | 6.9 | 3.0 |
| AC77652-1 | 3 | 266 | 210 | 78.8 | 4.3 | 1.7 |
| TC582-1 | 3 | 373 | 275 | 73.8 | 2.9 | 0.5 |
| WNC567-1 | 4 | 321 | 250 | 77.4 | 4.2 | 0.1 |
| Centennial Russet | 6 | 298 | 228 | 74.9 | 1.7 | 1.1 |
| Russet Burbank | 7 | 360 | 238 | 65.2 | 7.7 | 0.7 |

^{1/} Includes such defects as growth cracks, second growth, misshapen, and alligator hide.

^{2/} Based on tubers greater than 10 ounces.

FLORIDA

J. R. Shumaker, D. P. Weingartner, J. Watts, and R. E. Webb

Variety and Seedling Trials

Methods. Potato varieties and seedlings were tested for their adaptability and desirable horticultural characteristics at the Agricultural Research and Education Center, Hastings, Florida. Clones were grown in advanced trials (four replications). Telone[®] (6 gpa preplant) and Temik[®] (3 lb ai/A in-the-row at planting) were applied to all trials. Seed was spaced 12 inches apart in 20 foot single row plots. Between row spacing was 40 inches. The crop was planted on February 20 and 21 and harvested May 28-30. Commercial cultural practices were used in all tests. Yield of tubers, their appearance and specific gravity were taken at harvest. Tuber samples were shipped to Berwick, Pennsylvania, for chip color evaluations. The tests were grown under favorable conditions.

Round White and Seedling Adaptability and Processing Quality Trials. In 3 trials replicated 4 times and grown under favorable conditions, seedlings NY72, NY76, AT24-9, B9792-85, B9792-157, and B9555-46, Atlantic (standard chip processing cultivar) And WF31-4 and WF47-4 (USDA white flower selections from Atlantic) produced the best tuber yields and processing traits (Tables 1-2-3). Several USDA seedlings produced highly desirable tuber yields and chip processing traits when grown in observational trials. They will be evaluated in replicated trials during 1986. La Chipper (standard cultivar grown for early table stock market) Ontario, and CF 7523-1 produced some of the higher yields, and while they are not acceptable for chip processing, they do demonstrate excellent fresh market traits. Ontario will be further grower evaluated in 1986.

Long Russet Adaptability Trials. NemaRus, first russet-skin potato with high resistance to golden nematode race A, was released in 1985 by the Agricultural Research Service (USDA) and Florida and Maine Agricultural Experiment stations. Centennial, standard russet-skin cultivar, and Russette produced the highest tuber yields when grown in replicated trials (Tables 4-5). Tubers from both clones are considered oblong. NemaRus, which produces highly desirable long tubers, will be further grower evaluated in 1986.

Florida Table 1. Results from several clones selected for advanced testing at Hastings, Florida -- 1985.

| Cultivar | Yield ^{1/} (cwt/A) US 1A | Tuber Appear- ance ^{2/} | Specific Gravity | Chip Color ^{3/} | | | | Average |
|-------------|---|--|---------------------|--------------------------|-----|------|------|---------|
| | | | | 6/3 | 6/6 | 6/17 | 6/25 | |
| B9792-8B | 305 a | 6.5 | 1.076 | 2 | 3 - | 4 | 3 | 3.0 |
| Sebago | 265 ab | 6.8 | 1.061 | 3 | 3 + | 2 | 5 | 3.3 |
| Atlantic | 256 bc | 6.3 | 1.076 | 2 | 3 - | 2 + | 4 | 2.8 |
| Belchip | 248 b-d | 4.3 | 1.068 | 3 + | 3 | 2 | 4 | 3.0 |
| B9792-1 | 237 b-e | 6.0 | 1.064 | 2 | 2 | 1 | 3 | 2.0 |
| B8684-3 | 233 b-f | 5.3 | 1.070 | 3 | 3 | 3 | 4 | 3.3 |
| Denali | 227 b-f | 6.0 | 1.074 | 5 | 5 | 4 | 5 | 4.8 |
| Ontario | 214 c-g | 6.3 | 1.064 | 6 | 4 | 4 | 5 | 4.8 |
| New Norchip | 214 c-g | 5.0 | 1.070 | 2 - | 5 + | 2 | 5 | 3.5 |
| B9792-13B | 208 d-g | 6.8 | 1.069 | 3 | 4 | 1 | 3 | 2.8 |
| B9340-13 | 208 d-g | 6.3 | 1.070 | 2 | 2 | 2 | 4 | 2.5 |
| Norchip | 205 d-h | 5.0 | 1.066 | 3 + | 2 | 2 + | 4 | 3.8 |
| B9792-16B | 204 d-h | 4.7 | 1.072 | 1 | 3 | 2 | 4 | 2.5 |
| B9340-13 | 199 e-h | 5.3 | 1.070 | - | - | - | - | - |
| B9535-9 | 194 e-h | 5.3 | 1.063 | 4 | 3 | 2 | 5 | 3.5 |
| B9140-32 | 188 e-i | 5.8 | 1.073 | - | - | - | - | - |
| B9792-2B | 184 f-i | 7.0 | 1.074 | 2 | 3 | 1 | 3 | 2.3 |
| B8883-3 | 184 f-i | 6.3 | 1.063 | 3 | 3 | 4 | 4 | 3.5 |
| B9140-32 | 177 g-i | 7.5 | 1.072 | 2 | 1 | 1 | 3 | 1.8 |
| B8702-18 | 173 g-i | 4.8 | 1.059 | 4 | 5 | 5 | 5 | 4.8 |
| B9792-79 | 158 h-j | 6.0 | 1.066 | 1 | 2 | 2 + | 3 | 2.0 |
| B9792-14 | 146 ij | 6.3 | 1.062 | 3 | 5 | 3 | 5 | 4.0 |
| Superior | 143 ij | 7.3 | 1.067 | 4 | 3 | 3 | 3 | 3.3 |
| B9792-1B | 130 j | 6.8 | 1.060 | 3 + | 2 | 2 | 3 | 2.5 |

1/ Mean separation by Duncan's Multiple Range Test, 5% level.

2/ From 10.0 = most desirable to 0.0 = completely undesirable.

3/ Chip color: 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

Florida Table 2. Results from several clones selected for advanced testing at Hastings, Florida -- 1985.

| Cultivar | Yield ^{1/} (cwt/A) | Tuber Appear- ance ^{1,2/} | Specific Gravity | Chip Color ^{3/} | | | | | Average |
|--------------|--------------------------------|--|---------------------|--------------------------|------|-----|------|------|---------|
| | US 1A | | | 5/28 | 5/31 | 6/4 | 6/14 | 6/25 | |
| AT 24-9 | 292 a | 7.0 ab | 1.069 | 3 | 4 | 6 + | 5 | 5 | 4.6 |
| NY 76 | 246 ab | 6.8 a-c | 1.065 | 3 | 4 | 3 | 2 + | 4 | 3.2 |
| La Chipper | 244 ab | 4.8 cd | 1.070 | 2 | 3 | 3 + | 2 | 3 | 2.6 |
| NY 72 | 225 bc | 7.5 a | 1.072 | 3 | 3 | 3 | 3 | 4 | 3.8 |
| Atlantic | 218 b-d | 6.3 a-d | 1.083 | 3 | 2 | 3 + | 2 | 4 | 2.8 |
| CF 7523-1 | 202 b-e | 7.0 ab | 1.066 | 3 | 3 | 5 | 5 | 5 | 4.2 |
| Penn 71 | 200 b-e | 5.3 b-d | 1.067 | 2 | 3 | 3 | 5 | 3 | 3.2 |
| WF 564-3 | 197 b-f | 4.8 cd | 1.063 | 3 | 5 | 5 | - 5 | 5 | 4.6 |
| Sebago | 192 b-g | 7.0 ab | 1.066 | 3 | 3 | 4 | 5 | 4 | 3.8 |
| Sunrise | 184 c-h | 6.0 a-d | 1.071 | 2 | 3 | 3 | 3 | 3 | 2.8 |
| B7592-1 | 174 c-i | 6.3 a-d | 1.075 | 2 | 3 | 5 | 3 | 4 | 3.4 |
| NY 71 | 170 d-j | 6.0 a-d | 1.068 | 2 | 4 | 3 | 2 | 4 | 3.0 |
| WF 591-1 | 166 d-j | 5.8 a-d | 1.075 | 5 | 6 | 6 | 6 | 5 | 5.6 |
| AF 330-1 | 158 e-j | 6.3 a-d | 1.067 | 4 | 4 | 5 | 5 | 4 | 4.4 |
| CF 77154-10 | 157 e-j | 6.8 a-c | 1.073 | 3 | 3 | 3 + | 3 | 3 | 3.0 |
| AF 236-1 | 147 e-j | 7.3 ab | 1.075 | 2 | 2 | 3 | 3 | 3 | 2.6 |
| New Superior | 144 f-j | 6.5 a-d | 1.074 | 2 | 3 | 2 | 3 | 3 | 2.6 |
| NY 75 | 143 f-j | 5.3 b-d | 1.075 | 3 | 3 | 2 | 2 | 4 | 2.8 |
| AT 48-21 | 141 f-j | 6.3 a-d | 1.068 | 2 | 3 | 4 | 2 | 4 | 3.0 |
| A73-26 | 136 g-j | 6.3 a-d | 1.064 | 4 | 5 | 5 | 5 | 4 | 4.6 |
| PO 121-1 | 134 h-j | 5.5 a-d | 1.070 | 3 | 2 | 3 | 2 | 3 | 2.6 |
| Superior | 120 i-j | 6.5 a-d | 1.070 | 3 | 3 | 6 | 2 | 4 | 3.6 |
| AF 465-2 | 117 j | 6.5 a-d | 1.067 | 3 | 5 | 5 | 5 | 4 | 4.4 |
| PO 134-1 | 34 k | 4.5 d | 1.076 | 2 | 3 | 5 + | 3 | 4 | 3.4 |

1/ Mean separation by Duncan's Multiple Range Test, 5% level.

2/ From 10.0 = most desirable to 0.0 = completely undesirable.

3/ Chip color: 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

Florida Table 3. Results from several clones selected for advanced testing at Hastings, Florida -- 1985.

| Cultivar | Yield ^{1/} (cwt/A) US 1A | Tuber Appear- ance ^{1,2/} | Specific Gravity | Chip Color ^{3/} | | | | Average |
|-----------|---|--|---------------------|--------------------------|-----|------|------|---------|
| | | | | 6/3 | 6/6 | 6/18 | 6/25 | |
| B9792-157 | 282 a | 3.8 f | 1.061 | 3 | 2 | 3 | 3 | 2.8 |
| B9955-46 | 260 ab | 7.5 ab | 1.070 | 1 | 2 + | 1 | 3 | 1.8 |
| WF 31-4 | 256 a-c | 7.0 a-d | 1.076 | 3 | 2 | 4 | 3 | 3.0 |
| WF 47-4 | 239 a-d | 7.0 a-d | 1.074 | 3 | 3 | 5 | 4 | 3.8 |
| Sebago | 234 a-e | 6.8 a-d | 1.062 | 2 | 3 + | 2 | 5 | 3.0 |
| 76C-29-7 | 233 a-f | 6.0 a-e | 1.064 | 4 | 2 | 5 | 3 | 3.5 |
| 73C-26-1 | 219 a-g | 7.0 a-d | 1.065 | 3 + | 5 + | 5 | 4 | 4.3 |
| B9933-27 | 218 a-g | 6.3 a-e | 1.070 | 2 | 2 | 3 + | 4 | 2.8 |
| WF 46-3 | 216 a-h | 6.8 a-d | 1.074 | 2 | 4 | 2 | 3 | 2.8 |
| B9933-2 | 214 a-i | 6.5 a-d | 1.073 | 2 | 4 + | 4 | 5 | 3.8 |
| B9955-33 | 193 b-j | 5.8 b-e | 1.070 | 2 | 2 | 2 | 3 | 2.3 |
| B9955-18 | 188 c-j | 5.3 d-f | 1.073 | 1 | 3 + | 4 | 4 | 3.0 |
| Atlantic | 184 d-j | 6.8 a-d | 1.074 | 2 | 3 | 3 + | 4 | 3.0 |
| B9792-53 | 181 d-j | 6.5 a-d | 1.073 | 3 | 3 | 4 | 3 | 3.3 |
| B9931-22 | 180 d-j | 6.0 a-e | 1.069 | 4 | 3 | 2 | 4 | 3.3 |
| B9933-28 | 179 d-j | 6.0 a-e | 1.070 | 3 | 4 | 3 | 3 | 3.3 |
| B9955-28 | 176 d-j | 7.8 a | 1.058 | 3 | 2 + | 3 + | 3 | 2.8 |
| B0015-10 | 172 d-j | 5.8 b-e | 1.071 | 2 | 3 | 3 | 4 | 3.0 |
| B9932-51 | 170 d-j | 7.3 a-c | 1.062 | 2 - | 4 | 4 | 5 | 3.8 |
| B9792-61 | 167 e-j | 5.8 b-e | 1.067 | 2 + | 3 + | 3 | 3 | 2.8 |
| B9792-54 | 167 e-j | 4.5 ef | 1.072 | 2 - | 4 | 5 - | 4 | 3.8 |
| B9930-6 | 162 f-j | 5.8 b-e | 1.069 | 3 | 6 | 5 | 5 | 4.8 |
| B9935-8 | 159 g-j | 6.0 a-e | 1.055 | 2 | 2 | 3 + | 5 | 3.0 |
| B9792-69 | 156 g-j | 5.3 d-f | 1.069 | 1 | 3 | 5 | 4 | 3.3 |
| Superior | 149 g-j | 7.8 a | 1.065 | 2 - | 2 | 5 | 4 | 3.3 |
| B9955-38 | 148 g-j | 7.3 a-c | 1.069 | 2 | 3 | 3 | 3 | 2.8 |
| B9792-79 | 145 h-j | 5.5 c-f | 1.070 | 4 | 3 | 2 | 3 | 3.0 |
| B9955-10 | 143 ij | 6.5 a-d | 1.076 | 2 | 2 + | 1 | 3 | 2.0 |
| B9931-1 | 134 j | 5.5 c-f | 1.070 | 3 | 4 | 4 | 4 | 3.8 |
| B9955-21 | 125 j | 6.8 a-d | 1.066 | 2 | 2 + | 2 | 3 | 2.3 |

1/ Mean separation by Duncan's Multiple Range Test, 5% level.

2/ From 10.0 = most desirable to 0.0 = completely undesirable.

3/ Chip color: 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

Florida Table 4. Results from several russet clones selected for advanced testings at Hastings, Florida -- 1985.

| Clone | Yield ^{1/} (cwt/A) US 1A | Tuber Appearance ^{2/} | Specific Gravity |
|------------|---|-----------------------------------|---------------------|
| Russette | 175 a | 6.7 a-c | 1.074 |
| Centennial | 172 a | 7.7 a | 1.065 |
| B9752-7 | 171 a | 7.0 ab | 1.062 |
| B9553-6 | 151 ab | 4.3 bc | 1.063 |
| B9933-9 | 142 ab | 6.0 a-c | 1.068 |
| B9885-4 | 137 ab | 5.7 a-c | 1.063 |
| B9735-1 | 135 a-c | 5.7 a-c | 1.064 |
| B9569-2 | 133 a-c | 5.7 a-c | 1.064 |
| B9164-1 | 117 b-d | 6.0 a-c | 1.073 |
| B9926-11 | 106 b-e | 4.7 a-c | 1.068 |
| NemaRus | 104 b-f | 7.7 a | 1.060 |
| B9740-4 | 103 b-f | 4.7 a-c | 1.070 |
| B9648-9 | 102 b-f | 3.7 c | 1.064 |
| B9888-4 | 101 b-f | 4.0 bc | 1.064 |
| B9843-12 | 99 b-f | 6.3 a-c | 1.060 |
| B9738-3 | 98 b-f | 5.7 a-c | 1.063 |
| B9882-15 | 83 c-f | 4.7 a-c | 1.060 |
| B9882-16 | 82 c-f | 4.7 a-c | 1.061 |
| B9932-50 | 81 c-f | 4.3 bc | 1.073 |
| B9880-17 | 74 d-f | 6.0 bc | 1.061 |
| B9882-14 | 64 d-f | 5.3 bc | 1.061 |
| B9885-2 | 54 ef | 3.7 c | 1.065 |
| B9882-12 | 52 ef | 3.7 c | 1.065 |
| B9931-10 | 50 f | 4.3 bc | 1.062 |

1/ Mean separation by Duncan's Multiple Range Test, 5% level.

2/ From 10.0 = most desirable to 0.0 = completely undesirable.

Florida Table 5. Results from several russet clones selected for advanced testings at Hastings, Florida -- 1985.

| Clone | Yield ^{1/} (cwt/A) US 1A | Tuber Appearance ^{2/} | Specific Gravity |
|---------------|---|-----------------------------------|---------------------|
| Russette | 241 a | 6.7 | 1.070 |
| Minnesota 317 | 140 b | 6.3 | 1.067 |
| Norgold 534-1 | 138 bc | 7.3 | 1.060 |
| ND-388-1 | 137 b-d | 4.3 | 1.067 |
| B0012-19 | 132 b-e | 6.0 | 1.069 |
| B0012-5 | 125 b-f | 5.7 | 1.059 |
| Centennial | 117 b-f | 6.3 | 1.067 |
| B0012-1 | 111 b-f | 6.0 | 1.069 |
| B0012-4 | 97 b-f | 5.7 | 1.072 |
| B0012-16 | 96 b-f | 4.7 | 1.066 |
| B0012-7 | 84 c-f | 7.3 | 1.074 |
| NemaRus | 83 d-f | 6.3 | 1.056 |
| B9959-18 | 81 ef | 4.0 | 1.061 |
| B0013-5 | 75 f | 3.3 | 1.056 |

1/ Mean separation by Duncan's Multiple Range Test, 5% level.

2/ From 10.0 = most desirable to 0.0 = completely undesirable.

POTATO BREEDING - IDAHO - 1985

J.J. Pavek, D.L. Corsini, and S. Love

Yield Trials

Two hundred four selections (advanced, intermediate, preliminary) were grown in one or more of eight replicated yield trials at three locations. After harvest each entry was evaluated for internal quality. Advanced russet clones A7411-2 and A74114-4 and non-russet A76147-2 continue to show promise for yield and quality. These three clones are entered in the Western Regional Trial for 1986. Three clones (A70369-2, BR7093-24, TXA17-1) are being tested as potential chippers.

Field and Storage Diseases

Twenty-nine advanced selections and 11 cultivars were tested for reaction to verticillium wilt and scab in Aberdeen fields with natural inoculum; to early blight through the use of susceptible spreader rows interplanted with test plots; and to storage rots through inoculation of immature tubers at harvest with a combination of Fusarium sambucinum, F. coeruleum, and Erwinia atroseptica. Results are summarized in Idaho Table 1.

Reactions ranged from highly resistant to highly susceptible for each disease. Many of the cultivars and some of the selections have been evaluated previously and this data is consistent with previous ratings. Only one clone A7982-18, a medium to high yielding, high-quality russet, was outstanding in that it showed good resistance to all diseases tested. A number of selections and cv. Alpha showed moderate to high combined resistance to verticillium wilt and early blight; some of these were susceptible to scab and storage rot. Most of the selections offer much improved resistance over the standards Russet Burbank and Norgold Russet, particularly with regard to verticillium wilt and early blight. In general, wilt or blight ratings above 4, and storage rot ratings above 5 indicate degrees of susceptibility which may be difficult to interpret without access to yield or maturity information. On the other hand, given the intensity of disease in these tests, wilt and early blight ratings of 2 or less, scab ratings below 0.5, and rot ratings of 2 or less indicate a high level of resistance or tolerance.

Germplasm Distribution

The distribution of potato germplasm from the Aberdeen program during 1985 is summarized in Idaho Table 2.

Idaho Table 1. Disease Evaluations, Aberdeen 1985.

| Cultivar/Breeding Selection | Verticillium Wilt ¹ | Early Blight ² | Common Scab ³ | Storage Rot ⁴ |
|-----------------------------|--------------------------------|---------------------------|--------------------------|--------------------------|
| | 0-9 | 0-9 | 0-5 | 0-100 |
| Alpha | 1.0 | 2.0 | 1.8 | 6 |
| BelRus | 8.7 | 8.7 | 3.1 | 1 |
| Katahdin | 3.0 | 2.3 | 2.7 | 13 |
| Lemhi Russet | 6.7 | 6.7 | 0.3 | 6 |
| Nooksack | 7.0 | 4.7 | 0.1 | 3 |
| Norchip | 7.7 | 8.0 | 0.6 | 6 |
| Norgold Russet | 9.0 | 9.0 | 0.2 | 7 |
| NorKing | 8.7 | 7.7 | 0 | 18 |
| Rosa | 1.7 | 2.0 | 2.4 | 22 |
| Russet Burbank | 7.7 | 4.7 | 0.2 | 26 |
| Shepody | 5.7 | 6.0 | 3.0 | 7 |
| A7411-2 | 3.0 | 3.7 | 3.3 | 3 |
| A76147-2 | 4.7 | 4.7 | 2.0 | 3 |
| AC77652-1 | 7.3 | 6.7 | 3.9 | 3 |
| TC582-1 | 2.3 | 3.0 | 0 | 13 |
| A72685-2 | 4.0 | 2.7 | 1.7 | 17 |
| A77182-1 | 5.0 | 5.3 | 2.0 | 2 |
| A7815-7 | 3.7 | 3.3 | 0.4 | 7 |
| A7816-14 | 5.3 | 3.0 | 0.2 | 6 |
| A7896-7 | 3.0 | 4.3 | 0.3 | 26 |
| NDA848-3 | 1.3 | 3.0 | 0.1 | 46 |
| A7869-19 | 5.0 | 3.3 | 0 | 1 |
| A7946-10 | 6.7 | 6.3 | 0.1 | 27 |
| A7953-4 | 2.3 | 2.0 | 0.3 | 11 |
| A7961-1 | 4.0 | 4.3 | 0.1 | 8 |
| A7982-18 | 3.7 | 2.7 | 0.7 | 1 |
| A7987-14 | 1.7 | 2.0 | 0.2 | 24 |
| A7995-1 | 5.7 | 4.7 | 0.6 | 31 |
| A79172-6 | 6.3 | 5.7 | 0.4 | 5 |
| A79252-6 | 4.3 | 4.3 | 0.5 | 9 |
| A76260-16 | 8.0 | 8.3 | 1.4 | <1 |
| A79135-3 | 8.3 | 7.0 | 0.5 | 16 |
| A74114-4 | 8.0 | 6.3 | 1.2 | 2 |
| ND534-4Rus | 9.0 | 9.0 | 2.0 | 1 |
| 78LC-1 | 8.7 | 8.7 | 0.2 | 2 |
| NDA8694-3 | 9.0 | 8.9 | 0.2 | 10 |
| A66107-51 | 1.3 | 2.0 | 0.3 | 17 |
| BR6316-7 | 1.7 | 2.0 | 2.7 | 2 |
| LSD @5% | 1.7 | 1.5 | 1.1 | 15 |

¹ Verticillium wilt, 0 to 9 scale: 0=none; 1=trace to 1%; 2=1-5%; 3=5-10%; 4=10-25%; 5=25-40%; 6=40-60%; 7=65-70%; 8=75-90%; 9=>90% of stems in plot dead or dying with typical symptoms (Sept 6). In prior tests under similar conditions $r=0.51$ to 0.79 for wilt as a function of cfu *V. dahliae*/g stem.

² Early blight, same as above except based on % leaves with blight lesions/necrosis (Sept 3).

³ Common scab rated on a 0 to 5 scale based on an index (% tubers with scab) x (severity of scab lesions, 1-5) x (US grade of worst tuber, 1-3) x factor to convert to scale of 0-5.

⁴ Storage rot rated on a 0 to 100 scale based on an index [(fraction nonwounded tubers with rot x 10) + (fraction wounded tubers with rot) + (fraction tubers with soft rot x 10)] x (severity of rot, 1-5).

Idaho Table 2. Distribution of clones, seedlings, and seeds - 1985.

| LOCATION | COOPERATOR | NUMBER | LOCATION | COOPERATOR | NUMBER |
|----------------------------------|-----------------|-------------|--------------|-------------------|--------|
| <u>Clones:</u> | | | | | |
| Alberta | C. Schaupmeyer | 1 | Michigan | D. Chase | 14 |
| Arizona | F. Harper | 6 | Minnesota | F. Lauer | 1 |
| British Columbia | N. Wright | 2 | Missouri | J. Reeves | 10 |
| California | V. Amoah | 9 | Netherlands | Ir. Beekman | 9 |
| | D. Douches | 7 | New Mexico | E. J. Gregory | 3 |
| | A. Hakim-Elahi | 13 | North Dakota | R. Johansen | 1 |
| | M. Pecsok | 7 | | | |
| | R. Voss | 42 | | | |
| Colorado | D. Holm | 1 | Ohio | J. Peterson | 1 |
| Idaho | D. Clark | 6 | Oregon | D. Hane | 4 |
| | C. Davis | 6 | | G. Stanger | 3 |
| | D. Douglas | 2 | | J. Zalewski | 2 |
| | G. Kleinkopf | 9 | | | |
| | G. Kleinschmidt | 2 | South Dakota | P. Prashar | 2 |
| | G. McMaster | 5 | | | |
| | K. Mohan | 24 | Texas | J. C. Miller, Jr. | 2 |
| | G. Monroe | 2 | | D. Smallwood | 14 |
| | P. Muneta | 8 | | | |
| | T. Owing | 2 | Washington | Dr. Iritani | 7 |
| | D. Peterson | 11 | | M. Martin | 123 |
| | J. Peterson | 2 | | R. Thornton | 14 |
| | M. Willard | 1 | | | |
| | J. R. Davis | 2 | Utah | J. Kikkert | 1 |
| Kansas | T. Wagner | 47 | Wisconsin | B. Bowden | 5 |
| Maine | A. Reeves | 1 | | J. Fuller | 38 |
| | | | | R. Hanneman | 2 |
| | | | Wyoming | K. Bohnenblust | 3 |
| <u>Seedling tubers or seeds:</u> | | | | | |
| California | R. Voss | 48 families | | | |
| Colorado | D. Holm | 139 " | | | |
| North Dakota | R. Johansen | 64 " | | | |
| Oregon | D. Hane | 12 " | | | |
| | S. James | 98 " | | | |
| | A. Mosley | 153 crosses | | | |
| Texas | D. Smallwood | 91 families | | | |

LOUISIANA

James F. Fontenot, H. M. Brewer, K. C. Torres and
P. W. Wilson

Introduction

The objectives of the Louisiana potato breeding project remain the same but the procedure will be different since the seedling tubers produced in the greenhouse will not be initially planted in the north (Wisconsin) as in the past. These first year seedlings will be planted in Louisiana and thus more emphasis will be put on the environmental stress objectives such as drought, heat, frost, and air pollution tolerance. The goals of high yield and wide adaptability will not be diluted. Nor will the objectives of improved culinary quality, storage ability, tuber type, insect resistance and disease resistance be neglected.

Other objectives are to gain a further insight into the physiological changes during rest and to ascertain the effect of growth regulators, applied as preplant, preharvest and postharvest treatments on the production, storage ability and quality of potatoes. The total alkaloid content must be investigated.

The potato is the leading vegetable crop in the world and ranks fourth; behind rice, wheat, and corn; in economic value among the food crops of the world. The U.S. per capita consumption of this vegetable is over 100 pounds. It is one of the cheapest sources of carbohydrates and furnishes appreciable amounts of vitamins B and C, as well as some proteins. The increase in size, scope and volume of the potato processing industry has been one of the most important developments in the food field and this is coupled with the increase in per capita consumption of processed potatoes in the U.S. No clone exists today which is ideal for all or many of the uses made of potatoes whether in the processed form or the fresh table stock form. These are some of the reasons that it is foremost to continue the development of improved cultivars.

The fact that potato production can be completely mechanized and can fit into large as well as small operations is a great benefit. It is predicted that the acreage of potatoes in this state and nation will increase. This could help solve some of the concerns of the American public for both the plight of the farmer at home and hunger abroad.

Very few southern states have seen fit to include potato breeding as a research project for their state. Since none of these states produce certified seed potatoes it is of utmost importance that wide adaptability be our primary objective. We are unique in this respect because we realize unless a new clone will produce well in the areas of certified seed production (North) it will not be

available for southern production no matter what its producing potential.

Diverse genetic stock which possesses genes for desired characters will be used as parental lines and crosses will be made in the greenhouse and field. True seed derived from these crosses will be planted in the greenhouse in early November. These seedlings will be allowed to grow to a height of one to two inches and then transplanted to three inch pots and allowed to grow to maturity which will be early March. Approximately 15,000 to 20,000 seedlings will be grown each year. Probably only 50 percent will show sufficient promise to warrant further testing. Discards will be made due to poor yield, shape, color, and absence of other desirable characters. The selected clones will be placed in storage at 40° F and 85 percent relative humidity until early August when they will be planted in a field test plot at Baton Rouge, Louisiana. Natural stress conditions such as high temperature, drought, and high ozone levels exist at this time of year as well as a high insect population. These clones will be harvested in early December in order to take advantage of the average killing frost which occurs on November 20. Clones surviving these conditions will serve as valuable genetic stock to significantly improve environmental adaptation and metabolic efficiency of the potato.

First year numbered clones will be divided into two lots. One lot will be planted in Louisiana in March and the other lot will be planted in the north in late May.

All clonal selections will be screened with the listed objectives in mind and physiological experiments will be conducted on dormancy, suberization, etc.

There are many practical reasons to break dormancy or prolong dormancy of the potato tuber. The effect of clone, temperature, moisture availability, mineral nutrients and day length during the growing seasons should be explored further. Other effects are hormonal factors like abscisic acid, gibberellins, and etc.

The effects of several conditions on suberization will be investigated with the hope of promoting a more rapid and efficient occurrence of this very important physiological process in cut seed potatoes and whole tubers. The effect of some fatty acid applications along with acetic acid, potassium hydroxide, coenzymes along with certain fungicides will be used to determine suberin layer and wound periderm formation.

The most promising lines will be eradicated from all pathogens by use of tissue culture and thermotherapy.

Louisiana Trials

True potato seed were planted in the greenhouse on 11/6/84 and harvested on 3/6/85. All selections were stored at 5°

C and 85 percent relative humidity. Clones from 39 families were planted in the field on 8/7/85 and harvested 11/21/85. Heavy rains and high temperatures prevailed during the growing season and even though the plant stand was poor we made 112 selections at harvest. Outstanding parents were 12-60; 01-41; 01-5; 01-1; 01-18; 01-12; and 92-70. Parents which excelled in vigor were 31-124; 12-59; 42-38 and 81-20. Other first year clones were planted on the campus on 9/24/85 and were harvested on 12/20/85. Selections 51-113 through 51-183 were selected at that time and the most selections were made when the following parents were used: 01-18; 01-47; 42-38; 11-49; 12-60; 01-41 and the Ind. 78-59-1X01-38 combination.

We attempted to use the following Solanum species introduction in our breeding program S. acaule 472637; 472650; 472682; 472715; S. canasense 230511; 265864; S. chacoense 414144; 458311; S. demissum 161168; 365380; S. fendleri 275164; 458419; S. medians 283081; 473496; and S. stoloniferum 160224, and 186544.

The regional trial was planted at Baton Rouge on 3/12/85, and harvested on 6/20/85. This data is presented in Table 1. The top clones in yield of U.S. #1/cwt/A were Norland with 176; Red Pontiac 139; G670-11 with 136; La. 01-38 with 134; and MS700-83 with 125 cwt/A. The best lines in total solids were W842; MS716-15, MS704-10 and ND860-2. Outstanding entries in potato chip quality were Norchip; W903; La. 01-38; W842; and ND651-9. After this and many other characteristics were considered for overall worth as a cultivar La. 01-38 was rated first; Norland second; G670-11 third; MS700-83 fourth, and ND860-2 was rated fifth.

A summary of grade defects is presented in Table 2. Some clones produced a very large number of tubers with scab, growth cracks, and seasonal growth.

In another yield test harvest in 1985 the top clones in yield of U.S. #1's per plot were 43-18 with 19.8 pounds; Red LaSoda, 17.2; LaChipper, 17.2; 81-20 with 11.5 and 01-38 yielded 11.0 pounds. The same rank was held in total yield except LaChipper outyielded Red LaSoda.

Twelve clones selected in 1982 were tested in the spring of 1985 and six were designated as having some potential and these were 23-26 a vigorous late maturing line; 21-33 a clone medium in vigor and maturity; 21-37 a vigorous medium maturity selection with good tuber type; 21-46 rated medium in vigor and maturity an excellent tuber type; 21-77 medium in vigor and maturity; and last 21-113 a vigorous late maturing kind. The clone with the highest specific gravity was L21-33.

In the 1985 spring season 42 clones selected in 1983 were observed at Baton Rouge and 15 were considered worthy of further study. Five clones were considered to be of

excellent type those are 31-58; 31-94; 31-120, 31-131 and 31-211. In a tuber greening study only 31-94, 31-211 and 31-218 were rated low in that characteristic.

We selected 99 clones in September 1984 at Stark Farms, Wisconsin and 27 were rated good to excellent in plant and tuber type in the spring of 1985 at L.S.U. In a tuber greening study 41-68 showed no green color after 34 days light exposure; 41-38, 41-52 and 42-93 showed very slight greening.

Some cultivars and advanced lines were compared to the regional trial entries in chipping quality, boiling quality and tuber greening (Table 3). The five best clones in potato chip quality six days after harvest were 21-75; 01-47; Norchip; Wisc. 903 and LaChipper. Clones showing the least after-cooking darkening were Norchip; Wisc. 903; 21-46; LaChipper; Russet Burbank; 42-38; and 81-20. Tubers of certain lines were exposed to diffuse light for 30 days and no green color developed on tubers of Red Norland; 01-38; 12-59; Norgold Russet nor ND671-4.

An experiment was initiated on 9/24/85 to determine the influence of different plant growth regulators, hormones, and a fungicide on the germination, growth, and vigor of fall-planted Red LaSoda potatoes. The principle obstacle to producing potatoes in Louisiana in the fall is the establishment of a stand. After planting, seed potatoes tend to rot in the soil, especially if cut pieces were used. This may be attributed to cold, wet weather in September and October; to failure to satisfy seed dormancy requirements; or to the proliferation of soil microorganisms in the summer. Since a few seed pieces usually sprout regardless of adverse conditions, there are either random factors involved, or there are one or more controllable factors operating which may be approachable with available biochemical "handles", ie. growth regulators.

Table 3 summarizes the treatments, the solution concentrations of the growth regulators and fungicide, the duration of the seed-piece-dipping operation, and the condition of the seed piece used in this experiment. Standard abbreviations of several of the treatments were used. Both whole and cut seed pieces, dipped in water and not dipped in water were used as controls.

Red LaSoda potatoes were planted in an Olivier silt loam soil on September 24 after receiving the treatments outlined above. Each plot consisted of one row, four feet wide and 10 feet long with a five foot alley between replications. The experimental design was a randomized complete block with four replications of each treatment combination. A factorial arrangement of treatments was used with each growth regulator in combination with the fungicide.

The first two weeks after planting were relatively cold and wet. Therefore, beneficial effects of applied growth regulators may well have been expected. Herbicides were not used, since most are growth regulators. Since physical mechanical cultivation was not used until the sixth week, weed pressure was high.

The potatoes which had been treated with GA were the first to emerge and within three weeks had achieved 100 percent emergence. However, the application of Captan with GA delayed full emergence by one week. The early emergence of GA-treated potatoes appears at first to be desirable, but the emerging seedlings were all stems and few leaves. If GA were to be used commercially, it would be necessary to apply a different growth regulator after emergence to suppress further stem elongation.

Also notable is that by the end of the sixth week after planting all treatments had achieved ≥ 90 percent emergence except P293 and IAA.

The influence of growth regulators and a fungicide on the main stem length of fall-planted Red LaSoda potatoes was also measured. The longest stem length (37.5 cm) resulted from the application of GA to potato seed pieces and shortest stem length (11.4 cm) from the application of Alar. The application of Captan appeared to reduce the stem length four cm. or more for the following treatments: Medina, P293, GA, and Ethrel (25 ppm).

The temperature dropped to 24° F on 12/15/85 and the potatoes were harvested on 12/20/85. The growing season was too short to measure any yield differences.

Louisiana, Table 1. North central regional trial conducted at Baton Rouge - 1985.

| Selection Number or Variety | 1/ Aver. Mat. | | CWT/A Aver. Yield | | Aver. Percent US #1 | Aver. Total Solids | Gen. Merit Rating | Chip Color | Comments and General Notes |
|--------------------------------|---------------------|-----|-------------------------|----|---------------------------|--------------------------|-------------------------|------------------------------------|-------------------------------|
| | | | | | | | | | |
| EARLY TO MEDIUM EARLY | | | | | | | | | |
| Norland | 1 | 208 | 176 | 85 | 14.8 | 2 | 3.7 | Nice tuber type | |
| MN 11705 | 1 | 113 | 84 | 74 | 15.4 | | 3.1 | Poor stand due to freeze damage | |
| ND 651-9 | 1 | 99 | 65 | 66 | 14.8 | | 2.6 | Excellent in storage ability | |
| ND 860-2 | 1 | 169 | 123 | 73 | 16.2 | 5 | 3.0 | | |
| MEDIUM TO LATE | | | | | | | | | |
| La 12-59 | 3 | 164 | 120 | 73 | 14.8 | | 2.7 | | |
| La 01-38 | 3 | 170 | 134 | 79 | 14.8 | 1 | 2.4 | Excellent tuber type | |
| MS700-83 | 2 | 171 | 125 | 73 | 15.4 | 4 | 3.0 | | |
| MS704-10 | 2 | 113 | 77 | 68 | 16.2 | | 3.9 | Russet | |
| MS716-15 | 1 | 121 | 88 | 73 | 17.3 | | 3.0 | | |
| G670-11 | 4 | 167 | 136 | 81 | 16.7 | 3 | 2.7 | Nice tuber type | |
| MN 11816 | 2 | 53 | 34 | 64 | 14.8 | | 2.9 | Poor stand due to freeze damage | |
| MN 11903 | 1 | 39 | 30 | 77 | 15.2 | | 2.7 | Poor stand due to freeze damage | |
| ND671-4Russ | 3 | 50 | 32 | 64 | 14.8 | | 2.7 | | |
| W 842 | 3 | 121 | 77 | 64 | 18.2 | | 2.4 | | |
| W 903 | 3 | 109 | 79 | 72 | 14.8 | | 2.0 | | |
| W 949R | 2 | 116 | 84 | 72 | 14.8 | | 3.4 | | |
| Red Pontiac | 4 | 183 | 139 | 76 | 14.8 | | 3.7 | Second growth; poor type | |
| Russet Burbank | 5 | 23 | 15 | 65 | 14.8 | | 6.0 | Second growth; poor type | |
| Norgold Russet | 3 | 112 | 70 | 63 | 14.8 | | 4.3 | | |
| Norchip | 3 | 91 | 54 | 59 | 14.8 | | 2.0 | | |

1/ 1-Very Early-Norland maturity; 2-Early-Irish Cobbler maturity; 3-Medium-Red Pontiac maturity;
4-Late-Katahdin maturity; 5-Very Late-Kennebec or Russet Burbank maturity.

2/ Place top five among all entries including check varieties; disregard maturity classification.

3/ Chip Color - PCII Color Chart or Agron. Chipped six (6) days after harvest. Av. of seven (7) ratings - color chart.

Louisiana, Table 2. Summary of grade defects--regional trial--1985.

| Selection Number or Variety | Percent External Defects ^{1/} | | | | Total ^{3/} Tubers Free of External Defects |
|--------------------------------|--|------------------|------------------|--------------|--|
| | Scab ^{2/} | Growth Cracks | Second Growth | Sun Green | |
| <u>EARLY TO MEDIUM EARLY</u> | | | | | |
| Norland | 4 | 0 | 0 | 8 | 88 |
| MN 11705 | 8 | 0 | 0 | 0 | 92 |
| ND 651-9 | 0 | 4 | 4 | 4 | 88 |
| ND 860-2 | 4 | 0 | 0 | 8 | 88 |
| <u>MEDIUM TO LATE</u> | | | | | |
| La 12-59 | 24 | 8 | 12 | 0 | 56 |
| La 01-38 | 0 | 0 | 12 | 0 | 88 |
| MS700-83 | 0 | 16 | 0 | 8 | 76 |
| MS704-10 | 0 | 4 | 8 | 0 | 88 |
| MS716-15 | 12 | 4 | 0 | 0 | 84 |
| G670-11 | 0 | 20 | 8 | 0 | 72 |
| MN 11816 | 20 | 0 | 8 | 8 | 64 |
| MN 11903 | 8 | 0 | 4 | 4 | 84 |
| ND671-4Russ | 20 | 4 | 12 | 0 | 64 |
| W 842 | 4 | 0 | 4 | 0 | 92 |
| W 903 | 4 | 20 | 0 | 0 | 76 |
| W 949R | 0 | 8 | 0 | 0 | 92 |
| Red Pontiac | 4 | 16 | 40 | 0 | 40 |
| Russet Burbank | 0 | 4 | 88 | 0 | 8 |
| Norgold Russet | 4 | 0 | 16 | 0 | 80 |
| Norchip | 0 | 8 | 16 | 4 | 72 |

^{1/} Based on four 25 tuber samples (one from each replication). Percentage based on number of tubers.

^{2/} Includes all tubers with scab lesions whether merely surface, pitted or otherwise and regardless of area.

^{3/} This total - tubers free from any external defect of any sort.

Louisiana, Table 3. Cultivar differences in chipping quality, boiling quality, and tuber greening of Louisiana grown potatoes--1985.

| | Chip Evaluation ^{1/} | Boiling Test ^{2/} | Tuber Greening ^{3/} |
|----------------|-------------------------------|----------------------------|------------------------------|
| Red Norland | 3.7 | 4.0 | 1 |
| 01-38 | 2.4 | 3.0 | 1 |
| 12-59 | 2.7 | 3.7 | 1 |
| Russet Burbank | 6.0 | 1.7 | 2 |
| Norchip | 2.0 | 1.0 | 10 |
| Norgold Russet | 4.3 | 5.7 | 1 |
| ND 671-4 | 2.7 | 5.0 | 1 |
| Red Pontiac | 3.7 | 3.2 | 3 |
| ND 651-9 | 2.6 | 2.2 | 4 |
| Wisc 903 | 2.0 | 1.2 | 5 |
| Wisc 842 | 2.4 | 2.5 | 4 |
| Wisc 949 R | 3.4 | 2.5 | 2 |
| G 670-11 | 2.7 | 3.5 | 5 |
| M.S. 700-83 | 3.0 | 6.3 | 4 |
| M.S. 704-10 | 3.9 | 2.7 | 3 |
| M.S. 716-15 | 3.0 | 3.2 | 5 |
| Minn 11705 | 3.1 | 2.7 | 4 |
| Minn 11816 | 2.9 | 3.3 | 3 |
| Minn 11903 | 2.7 | 2.8 | 2 |
| ND 860-2 | 3.0 | 6.0 | 4 |
| Kennebec | 3.0 | 2.0 | 10 |
| Alt-62-90-64 | 2.6 | 2.5 | 8 |
| 21-37 | 2.4 | 2.2 | |
| 21-113 | 2.3 | 4.7 | 9 |
| 21-75 | 1.9 | 4.3 | |
| 21-46 | 2.9 | 1.3 | |
| 21-77 | 3.1 | 5.7 | |
| 01-38 | 2.6 | 7.7 | |
| 23-26 | 3.4 | 2.2 | 2 |
| 42-38 | 3.4 | 1.7 | 4 |
| 21-33 | 2.6 | 2.5 | |
| 81-20 | 2.6 | 1.7 | 9 |
| Red LaSoda | 3.4 | 1.8 | 2 |
| 82-119 | 2.4 | 3.5 | |
| 01-47 | 2.0 | 2.5 | |
| 31-124 | 3.0 | 3.0 | 10 |
| LaChipper | 2.0 | 1.3 | 8 |
| 43-18 | 2.1 | 1.8 | 4 |
| 01-41 | 2.6 | 5.8 | |
| 43-18 | 2.4 | 1.8 | 4 |

^{1/} 1 = excellent chip color six days after harvest.
10 = unacceptable color six days after harvest.

^{2/} 1 = excellent color.
10 = unacceptable color.

^{3/} tubers exposed to different light in the laboratory for 30 days.
1 = no green color.
10 = very green color.

Louisiana, Table 4. Treatments used in the fall-planted-potato test.

| Treatment | Solution concentration | Duration of dip | Seed-piece condition |
|------------------------------------|--------------------------------|----------------------------------|----------------------|
| Without Captan | | | |
| Ethrel | 500 ppm | 5 min. | cut |
| Medina | (1 gal./4000 ft ²) | 5 min. | cut |
| P293 | 200 ppm | 5 min. | cut |
| Alar | 1000 ppm | 5 min. | cut |
| GA | 10 ppm | 5 min. | cut |
| IAA | 1000 ppm | 5 min. | cut |
| Kinetin | 50 ppm | 5 min. | cut |
| Ethrel | 25 ppm | 5 min. | cut |
| Captan | 2000 ppm | 5 min. | cut |
| H ₂ O | ----- | ----- | cut |
| H ₂ O | ----- | ----- | whole |
| N ₆ H ₂ O | ----- | ----- | cut |
| No H ₂ O | ----- | ----- | whole |
| Captan | 2000 ppm | 5 min. | whole |
| With Captan (2000 ppm, 5 min. dip) | | | |
| Ethrel | 500 ppm | 5 min. | cut |
| Medina | (1 gal./4000 ft ²) | 5 min. | cut |
| P293 | 200 ppm | 5 min. | cut |
| Alar | 1000 ppm | 5 min. | cut |
| GA | 10 ppm | 5 min. | cut |
| IAA | 1000 ppm | 5 min. | cut |
| Kinetin | 50 ppm | 5 min. | cut |
| Ethrel | 25 ppm | 5 min. | cut |
| Captan | 2000 ppm | = 10 min. single strength dip | cut |

Maine

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Introduction: Forty potato varieties and clones were tested at Aroostook Farm, Presque Isle, Maine during the 1985 growing season. This test was conducted as part of the NE 107 Regional Project (Breeding and Evaluation of Potato Clones for the Northeast).

Methods: Single row plots, 25 feet long were planted on May 22 using a randomized complete block design and six replications. Fertilization consisted of 1200 lbs/A of 12 - 12 - 12, banded at planting. Cultural practices were similar to those used on commercial farms in the area and date of vine kill was based on maturity classification of the cultivars (please see Maine Tables 2, 3, 4). Specific gravity was determined using the weight in air, weight in water method. Hollow heart ratings indicate the number of hollow tubers found per 60 large tubers examined. All seed tubers were supplied by the Maine Seed Potato Board (Sangerville Project).

Results: Weather conditions during 1985 were ideal and rainfall was uniformly distributed throughout most of the summer (Maine Table 1.). As a result, yield and quality were excellent for many of the test varieties. Within the early and medium-early tests, only four clones demonstrated yield potential equal to Superior (Maine Table 2.). These clones were CS7697-24, CF7679-15, CS7639-1, and F70021. Of these four, all had marginal or poor processing characteristics, but tuber appearance for fresh market was good for all except F70021. Tubers from CF76183-2, CF77154-10, B9340-13, and Superior had acceptable chip colors; however, of these four only Superior and B9340-13 attained acceptable yields.

Within the medium and medium-late trials, usable yield of AF474-2 and F74123 exceeded that of Kennebec, while those of several others were equal to Kennebec (Maine Table 3.). Processing characteristics of these two clones were unacceptable; however, tuber appearance was quite good. B9140-32 and W752 had acceptable chip and fry colors; however, yield of the former was very low. Northing Russet was an acceptable russeted selection for fresh market and processing, except that average tuber size was very small.

Yields were generally very high within the late trial (Maine Table 4.). Tuber appearance, usable yield, and specific gravity were particularly good for Elba and CS7635-4. The former does not process, while CS7635-4 may be useful for french fries or chipping if handled properly. Yield and quality of russeted/long types were exceptional during 1985 (Maine Table 4.). Usable yield and specific gravity were highest for

Russet Burbank, A7411-2, and A72685-2, however, tuber appearance was below average for the latter two. Fry colors were acceptable for all clones except A72685-2 and CS73105-2R.

Complete details of these trials will be published in the 1985 Performance Evaluations for Potato Clones and Varieties in the Northeastern States. This bulletin will be available from the Public Information and Central Services (PICS), University of Maine; Orono, Maine 04469.

Maine Table 1. Weekly average minimum and maximum air temperatures and total weekly rainfall for Aroostook Farm, Presque Isle, Maine - 1985.

| Week Ending | | Avg. Temperature F | | Rainfall Inches |
|-------------|--------------|--------------------|------|--------------------|
| | | Min. | Max. | |
| May | 13 - 19 | 39 | 64 | 2.1 |
| | 20 - 26 | 42 | 71 | 0.3 |
| | 27 - June 2 | 46 | 72 | 0.8 |
| June | 3 - 9 | 44 | 73 | 0.8 |
| | 10 - 16 | 45 | 66 | 1.0 |
| | 17 - 23 | 50 | 74 | 0.7 |
| | 24 - 30 | 50 | 71 | 1.6 |
| July | 1 - 7 | 54 | 84 | 2.5 |
| | 8 - 14 | 55 | 76 | 0.7 |
| | 15 - 21 | 59 | 80 | 1.1 |
| | 22 - 28 | 52 | 78 | 0.6 |
| | 29 - Aug. 4 | 51 | 75 | 1.4 |
| Aug. | 5 - 11 | 54 | 83 | 0.1 |
| | 12 - 18 | 51 | 78 | 0.6 |
| | 19 - 25 | 48 | 73 | 0.2 |
| | 26 - Sept. 1 | 48 | 69 | 0.7 |
| Sept. | 2 - 8 | 51 | 66 | 0.4 |
| | 9 - 15 | 40 | 63 | 0.6 |
| | 16 - 22 | 47 | 77 | 0.0 |
| | 23 - 29 | 47 | 69 | 1.8 |
| Total | | | | 18.0 |

Maine Table 2. Yield, usable yield, percent defects, tuber size distribution, specific gravity, hollow heart ratings, tuber appearance, chip color, and french fry color for early and medium-early varieties grown at Presque Isle, Maine - 1985.

| Variety | Yield (Cwt/A) | | % Defects | Size Distribution (%) | | | Spec ¹ Grav ¹ | Hollow Heart Rating | Tuber App ² | Chip Color ³ | French Fry Color ⁴ |
|------------------------------|---------------|--------|-----------|-----------------------|----------|----------------|-------------------------------------|---------------------|------------------------|-------------------------|-------------------------------|
| | Total | Usable | | 1-7/8 | to 4 in. | 2-1/2 to 4 in. | | | | | |
| Early Test-100 days | | | | | | | | | | | |
| Superior | 362 | 357 | 1.3 | 98.7 | 45.9 | 91 | 0 | 4 | 7.0 | 1.8 | |
| Redsen | 330 | 323 | 2.0 | 95.9 | 49.2 | 77 | 0 | 3 | 7.5 | 2.8 | |
| AF339-5 | 347 | 311 | 10.4 | 96.9 | 73.9 | 85 | 3 | 1 | 8.1 | 3.0 | |
| B9569-2 | 262 | 259 | 1.3 | 96.1 | 26.5 | 86 | 0 | 3 | 8.4 | 3.4 | |
| CF76183-2 | 335 | 289 | 13.5 | 98.5 | 53.9 | 87 | 6 | 3 | 6.0 | 1.1 | |
| CF77154-10 | 307 | 300 | 2.0 | 98.2 | 40.0 | 92 | 0 | 2 | 4.9 | 1.1 | |
| CS7697-24 | 386 | 352 | 8.8 | 96.7 | 56.8 | 86 | 0 | 4 | 7.3 | 2.4 | |
| Maller Duncan LSD (K=100) | 26 | 24 | | | | 4 | | | | | |
| Medium-Early Test-105 days | | | | | | | | | | | |
| Superior | 407 | 398 | 2.1 | 98.3 | 49.2 | 91 | 0 | 3 | 7.0 | 1.8 | |
| AF465-2 | 332 | 326 | 2.0 | 94.4 | 29.6 | 87 | 0 | 2 | 7.9 | 3.0 | |
| B9340-13 | 388 | 373 | 3.9 | 97.4 | 44.5 | 89 | 0 | 2 | 6.4 | 1.4 | |
| CF7679-15 | 408 | 394 | 3.4 | 94.6 | 72.7 | 88 | 1 | 4 | 8.1 | 2.7 | |
| CF7750-1 | 395 | 383 | 2.9 | 97.6 | 72.1 | 84 | 0 | 3 | 8.3 | 3.4 | |
| CS7296-5 | 352 | 320 | 9.3 | 95.7 | 60.2 | 82 | 3 | 2 | 8.7 | 3.8 | |
| CS7639-1 | 425 | 409 | 3.8 | 97.0 | 73.7 | 76 | 0 | 4 | 9.3 | 4.3 | |
| CS7747-7 | 410 | 341 | 16.8 | 98.2 | 57.7 | 89 | 2 | 2 | 9.3 | 4.3 | |
| F70021 | 436 | 419 | 3.9 | 98.0 | 68.1 | 79 | 2 | 2 | 9.1 | 4.4 | |
| Maller Duncan LSD (K=100) | 32 | 37 | | | | 2 | | | | | |

¹/1.0 omitted

²/Tuber appearance: 1= poor, 5= excellent

³/chip color: 1-7 acceptable, > 7 unacceptable

⁴/French Fry color: 1-3 acceptable, >3 unacceptable

Maine Table 3. Yield, usable yield, percent defects, tuber size distribution, specific gravity, hollow heart ratings, tuber appearance, chip color, and french fry color for medium and medium-late varieties grown at Presque Isle, Maine - 1985.

| Variety | Yield (Cwt/A) | | % | Size Distribution (%) | | Spec ₁ | Hollow | Tuber | Chip | French |
|----------------------------------|---------------|--------|---------|-----------------------|----------------|-------------------|--------|------------------|--------------------|--------|
| | Total | Usable | Defects | 1 7/8 to 4 in. | 2 1/2 to 4 in. | Grav ₁ | Heart | App ₂ | Color ₃ | Fry |
| <u>Medium Test-110 days</u> | | | | | | | | | | |
| Kennebec | 473 | 442 | 6.7 | 96.4 | 70.0 | 88 | 1 | 3 | 7.5 | 2.6 |
| Rhine Red | 441 | 438 | 0.6 | 95.5 | 64.0 | 78 | 0 | 3 | 8.4 | 3.2 |
| AF9058-M | 433 | 384 | 11.1 | 97.0 | 54.0 | 74 | 0 | 1 | 9.3 | 4.0 |
| B9140-32 | 273 | 267 | 2.2 | 97.4 | 67.0 | 85 | 6 | 3 | 5.6 | 1.1 |
| CS77120-8 | 480 | 411 | 14.5 | 95.9 | 66.5 | 86 | 6 | 3 | 7.6 | 2.9 |
| F74123 | 496 | 480 | 3.2 | 97.2 | 67.6 | 84 | 1 | 3 | 9.0 | 4.5 |
| W752 | 413 | 387 | 6.1 | 97.0 | 53.9 | 101 | 0 | 2 | 6.6 | 1.4 |
| WF591-1R | 429 | 395 | 7.7 | 94.4 | 67.0 | 83 | 2 | 2 | 8.9 | 3.3 |
| Waller Duncan LSD (K=100) | 42 | 38 | | | | 4 | | | | |
| <u>Medium-Late Test-115 days</u> | | | | | | | | | | |
| Kennebec | 435 | 379 | 12.9 | 96.5 | 74.8 | 88 | 0 | 3 | 7.5 | 2.6 |
| Norking Russet | 352 | 346 | 1.6 | 28.0<4 oz. | 9.2>10 oz. | 90 | 0 | 3 | 7.6 | 2.5 |
| Shepody | 397 | 334 | 15.9 | 7.9<4 oz. | 41.5>10 oz. | 94 | 0 | 2 | 7.9 | 3.0 |
| AF474-2 | 444 | 420 | 5.3 | 97.6 | 67.0 | 86 | 1 | 4 | 8.7 | 3.1 |
| ND534-4 | 369 | 359 | 2.5 | 22.4<4 oz. | 13.0>10 oz. | 80 | 0 | 4 | 9.0 | 3.1 |
| Waller Duncan LSD (K=100) | 43 | 53 | | | | 3 | | | | |

See footnotes Table 2.

Maine Table 4. Yield, usable yield, percent defects, tuber size distribution, specific gravity, hollow heart ratings, tuber appearance, chip color, and french fry color for late and russet/long varieties grown at Presque Isle, Maine - 1985.

| Variety | Yield (Cwt/A) | | % Defects | Size Distribution (%) | | Spec Grav ¹ | Hollow Heart Rating | | Tuber App ² | Chip Color ³ | French Fry Color ⁴ |
|------------------------------|---------------|--------|-----------|-----------------------|----------------|------------------------|---------------------|---|------------------------|-------------------------|-------------------------------|
| | Total | Usable | | 1-7/8 to 4 in. | 2-1/2 to 4 in. | | 0 | 1 | | | |
| Late Test-120 days | | | | | | | | | | | |
| Katahdin | 428 | 395 | 7.7 | 96.0 | 73.2 | 84 | 0 | | 3 | 7.7 | 2.8 |
| Elba | 480 | 461 | 3.9 | 96.4 | 67.8 | 90 | 0 | | 5 | 9.0 | 4.2 |
| Hampton | 447 | 425 | 5.2 | 97.2 | 78.4 | 84 | 0 | | 4 | 8.2 | 3.5 |
| CS7635-4 | 461 | 445 | 3.5 | 97.1 | 73.9 | 100 | 0 | | 5 | 7.3 | 2.7 |
| NY64 | 487 | 430 | 11.6 | 97.6 | 62.8 | 89 | 0 | | 3 | 8.1 | 3.9 |
| Waller Duncan LSD (K=100) | 56 | 59 | | | | 4 | | | | | |
| Russet/Long Test-130 days | | | | | | | | | | | |
| | | | | <4 oz. | >10 oz. | | | | | | |
| Russet Burbank | 427 | 382 | 10.4 | 19.1 | 22.2 | 99 | 0 | | 3 | 7.9 | 2.7 |
| GoldRus | 365 | 334 | 8.6 | 13.7 | 36.5 | 86 | 6 | | 4 | 7.0 | 1.8 |
| NemaRus | 420 | 366 | 12.6 | 8.9 | 45.9 | 83 | 4 | | 3 | 7.5 | 2.2 |
| A7411-2 | 468 | 433 | 7.5 | 14.8 | 32.6 | 98 | 1 | | 2 | 8.0 | 2.7 |
| A72685-2 | 448 | 406 | 9.2 | 16.8 | 31.9 | 98 | 3 | | 2 | 9.4 | 4.3 |
| B9540-55 | 374 | 339 | 9.2 | 12.7 | 27.0 | 82 | 0 | | 3 | 6.9 | 2.0 |
| B9596-2 | 372 | 351 | 5.6 | 12.5 | 10.5 | 85 | 0 | | 3 | 8.8 | 3.0 |
| CS73105-2R | 374 | 341 | 8.9 | 76.8 (2½ to 4 inches) | | 80 | 0 | | 3 | 9.1 | 4.2 |
| Waller Duncan LSD (K=100) | 43 | 42 | | | | 6 | | | | | |

See footnotes on Table 2.

MAINE -- 1985

Alvin F. Reeves, Robert B. Long, and Garland S. Grounds

Potato Breeding

Seed and seedling production. Seed production was in three areas: 1. combining high yields with scab resistance in round white table varieties, 2. combining long russets with high yield and high dry matter, and 3. crossing selections with good chip color to round white selections with high dry matter and good yields. Fifty-seven parents were used in 95 crosses to produce 114,000 seeds. Open-pollinated fruits from field-grown plots yielded a total of 1,672,000 seeds. These came from six russet selections, two chipping selections, and three round white varieties. Greenhouse plantings of true seed produced 59,277 seedlings from which 41,389 tubers were harvested.

Seedling selection. A total of 381 (0.9%) new selections were saved from 42,300 single hills. From the 194 12-hill plots, 29 (15%) were saved for further testing. Thirty-five 60-hill plots, 61 advanced selections, and 40 Campbell selections were maintained and tested.

Protoclonal selection. One-hundred-twenty-nine clones from culture of Russet Burbank leaf protoplasts were field tested. Nineteen of these were grown in replicated yield test plots. Eight of these clones had yields equal to Russet Burbank, and three clones had higher specific gravity than Russet Burbank.

Disease tests. In cooperation with Drs. Franklin Manzer, Richard Storch, Bill Brodie, Robert Goth, Gilbert Banville, Simeon Leach, and Robert Young, a number of selections were tested for resistance to several diseases. All tests were inoculated either directly or on spreader rows within the plots. Results were as follows: 26 of 75 selections tested were resistant to early blight; 25 of 51 to late blight; 34/130 to common scab; 4/25 to leafroll; 23/51 to acid scab; 58/149 to verticillium; 133/161 to net necrosis; 20/64 to virus X; and 9/34 to golden nematode.

Physiological disorders. Additional tests for physiological problems showed 38 of 148 resistant to greening; 25/80 to hollow heart; 47/56 to blackspot bruising; and 46/56 to shatter bruising.

Yield tests. A total of 121 selections were grown in replicated yield tests in 1985. Thirteen yielded better than the control varieties, 43 had specific gravities higher than the controls, and two bettered the controls in both respects. Early and medium-early maturing selections were given 120 pounds of nitrogen per acre and killed at 90 days and 95 days, respectively. Medium maturity selections were given 140 pounds of nitrogen and killed at 103 days. Medium-late selections were given 160 pounds of nitrogen and killed at 109 days.

Chip tests. After processing in December and February from four different storage temperatures, four selections and Allagash Russet had better chip color than Monona: AF 236-1, AF 307-5, AF 324-1, and CS 7232-4.

Grower trials of advanced selections. Nine unnamed selections were grown on commercial farms in 1985: AF 92-3, AF 236-1, AF 465-2, BR 7088-18, CF 7353-1, CF 7523-1, CS 7232-4, CS 7697-24, and WF 564-3.

Round white tablestock selections:

Early maturing: CS 7697-24 is very high yielding. Its scab susceptibility will be a problem.

Mid-season: CF 7523-1 has shown promise in field tests. However, it is susceptible to scab, Fusarium, and blackleg. In cooking tests in Maine, it showed extensive sloughing.

Full season: AF 92-3 has good disease resistance, but yields are inconsistent and appearance not as good as desired.

BR 7088-18 has very high dry matter and some verticillium resistance.

Russet tablestock selection: WF 564-3 has been a high yielding selection with good table quality, but is too wet for good processing.

Countbox and processing selections: AF 236-1 is a pretty oblong white-skinned line with good dry matter and low sugars. AF 465-2 is a pretty long russet selection with good dry matter, but marginal yields.

Chipping selection: CS 7232-4 has excellent chip color after long term storage. Its dry matter is variable, and yields similar to Monona.

Special purpose selections: CF 7353-1 is a purple-skinned selection with great production and culinary qualities. Its one drawback is scab susceptibility.

Maine Table 1. Characteristics of some advanced selections from the Maine breeding program.

| Pedigree | Resistance to <u>5/</u> | | | | | | | | | | | | | | | | | | |
|--|-------------------------|--------------------------|--------------------------|---------------------|------------------------------|--------------------------|----------------------------------|---------------------------------|------------------------|----------------------------|---------|----------|--------------|-------------|--------------|-----------|-------------|--------------|-----------------|
| | Maturity ^{1/} | Skin color ^{2/} | Tuber type ^{3/} | Yield ^{4/} | Cooked quality ^{4/} | Chip color ^{4/} | Percent dry matter ^{4/} | Storage qualities ^{4/} | Brusings ^{4/} | Hollow Heart ^{4/} | Virus X | Leafroll | Net necrosis | Late blight | Early blight | Acid scab | Common scab | Verticillium | Golden nematode |
| Round white tablestock | | | | | | | | | | | | | | | | | | | |
| Early Maturing | | | | | | | | | | | | | | | | | | | |
| Sunrise | E | W | OR | A | G | A | G | A | M | E | E | S | R | S | S | M | M | M | R |
| AF686-3 | E | C | R | E | A | A | M | F | E | U | S | S | R | S | S | M | M | S | S |
| CF7679-15 | EM | C | OR | E | E | M | E | F | U | | R | S | R | S | S | S | S | R | S |
| Mid Season | | | | | | | | | | | | | | | | | | | |
| AF474-2 | M | W | O | G | A | U | A | F | M | A | R | S | R | S | M | M | M | S | R |
| AF790-1 | M | C | R | G | A | A | A | F | E | E | S | S | R | S | S | M | M | S | R |
| AF828-5 | M | W | RO | G | A | U | M | F | E | E | S | S | R | S | R | S | S | M | R |
| CF7523-1 | M(E) | W | RO | E | G | A | A | M | G | E | S | S | R | S | R | S | S | R | R |
| AF909-5 | M | W | R | G | F | M | A | F | E | A | F | F | R | S | S | M | R | S | F |
| AF909-8 | ME | W | R | E | F | M | A | F | E | M | S | F | R | S | S | R | S | R | F |
| AF910-2 | M | WC | R | G | F | U | G | F | M | A | S | F | R | S | S | R | S | R | F |
| AF1011-7 | M | W | RO | E | F | G | G | F | E | G | F | F | F | F | R | F | S | S | F |
| Full Season | | | | | | | | | | | | | | | | | | | |
| AF303-5 | ML | W | RO | G | M | M | G | F | G | E | S | S | R | R | R | S | S | R | S |
| Russet tablestock | | | | | | | | | | | | | | | | | | | |
| WF564-3 | ME | R | O | E | A | U | A | G | G | A | R | S | R | R | M | R | R | S | S |
| WF591-1 | ME | R | OR | G | A | M | G | F | G | A | S | S | R | S | M | R | R | S | S |
| Long russet for processing or count. box | | | | | | | | | | | | | | | | | | | |
| AF465-2 | ME | R | OL | M | A | M | A | F | E | M | S | S | R | S | S | R | M | S | S |
| AF522-1 | M | R/W | OL | A | A | U | G | F | A | E | S | R | R | M | S | M | M | S | R |
| CF80218-1 | E | LR | O | G | M | U | E | F | A | G | S | R | R | S | S | S | S | S | R |

Maine Table 1. Continued

| Pedigree | Maturity ¹ / ₁ | Skin color ² / ₂ | Tuber type ³ / ₃ | Yield ⁴ / ₄ | Cooked quality ⁴ / ₄ | Chip color ⁴ / ₄ | Percent dry matter ⁴ / ₄ | Storage qualities ⁴ / ₄ | Bruising ⁴ / ₄ | Hollow Heart ⁴ / ₄ | Virus X | Leafroll | Net necrosis | Late blight | Early blight | Acid scab | Common scab | Verticillium | Golden nematode | Resistance to ⁵ / ₅ | |
|--|--------------------------------------|--|--|-----------------------------------|--|--|--|---|--------------------------------------|--|---------|----------|--------------|-------------|--------------|-----------|-------------|--------------|-----------------|---|--|
| | | | | | | | | | | | | | | | | | | | | | |
| Long white for processing or count box | | | | | | | | | | | | | | | | | | | | | |
| AF236-1 | ME | WC | OL | G | A | E | G | A | A | M | S | S | R | R | R | S | M | S | S | S | |
| AF339-5 | ME | W | OL | G | A | A | E | F | M | A | S | S | R | M | R | S | M | S | S | S | |
| AF671-8 | M | W | O | G | F | G | E | F | A | G | F | S | R | M | M | S | S | S | R | S | |
| AF994-6 | M | DC | OL | E | F | M | E | F | F | E | F | F | F | R | R | F | S | S | S | F | |
| Chipping types | | | | | | | | | | | | | | | | | | | | | |
| AF330-1 | E(M) | W | R | A | A | E | G | F | M | A | S | S | R | M | M | S | S | S | S | S | |
| AF564-1 | ML | Y | R | A | A | G | E | F | A | E | S | S | R | S | S | S | S | S | M | S | |
| CF7353-1 | ML | Pu | O | G | E | G | G | G | M | G | S | S | R | S | R | S | S | S | R | S | |
| CF77154-10 | E | C | OR | M | A | G | E | F | A | E | S | S | R | S | M | M | M | M | S | R | |
| AF845-11 | M | B | R | G | F | C | E | F | A | G | S | F | R | R | M | M | M | M | M | F | |
| AF875-9 | ML | W | R | G | F | C | E | F | A | E | S | F | R | S | M | M | R | S | M | F | |
| AF875-15 | ME | C | R | A | F | C | E | F | G | E | S | F | R | S | S | M | R | S | M | F | |
| AF875-16 | ML | W | R | G | F | E | E | F | G | C | S | F | R | S | S | M | S | S | S | F | |
| AF875-17 | ML | W | R | G | F | E | E | F | M | C | S | F | R | S | S | R | R | S | S | F | |
| AF879-3 | M | W | R | G | F | E | E | F | G | E | S | F | R | S | S | R | S | M | S | F | |
| AF879-21 | M | DC | RO | G | F | E | E | F | A | E | S | F | R | S | S | R | S | S | S | F | |
| AF1022-1 | ME | DC | R | A | F | E | E | F | F | C | F | F | F | F | S | F | R | R | S | F | |

Maine Table 1. Continued

-
- 1/ E = early, M = medium, L = late.
- 2/ W = white, C = cream, Y = yellow, B = buff, R = russet, Pu = purple,
Re = red, L = light, D = dark.
- 3/ R = round, O = oblong, L = long.
- 4/ Rated as U = unacceptable, M = marginal, A = acceptable, G = good,
E = excellent, F = further testing needed.
- 5/ R = resistant, M = moderately resistant, S = susceptible, F = further
testing needed.

Maine Table 2. Characteristics of some advanced selections from the Campbell breeding program.

| Pedigree | Resistance to $\frac{5}{}$ | | | | | | | | | | | | |
|------------------------|----------------------------|-------------------------|-------------------------|--------------------|-----------------------------|-------------------------|---------------------------------|--------------------------------|-----------------------|---------------------------|---------|----------|--------------|
| | Maturity $\frac{1}{}$ | Skin color $\frac{2}{}$ | Tuber type $\frac{3}{}$ | Yield $\frac{4}{}$ | Cooked quality $\frac{4}{}$ | Chip color $\frac{4}{}$ | Percent dry matter $\frac{4}{}$ | Storage qualities $\frac{4}{}$ | Bruising $\frac{4}{}$ | Hollow Heart $\frac{4}{}$ | Virus X | Leafroll | Net necrosis |
| Round white tablestock | | | | | | | | | | | | | |
| Early Maturing | | | | | | | | | | | | | |
| CS7589-8 | E W | R | R | E | A | A | U | F | E | A | S | S | R |
| CS7639-1 | E W | RO | RO | E | A | U | M | F | A | A | R | S | R |
| CS78289-1 | ME WC | RO | RO | G | F | F | G | F | E | E | F | M | R |
| CS7983-26 | ME WC | RO | RO | G | F | U | M | F | A | E | S | R | R |
| Mid Season | | | | | | | | | | | | | |
| CS7685-6 | M WC | RO | RO | G | A | U | G | F | A | E | S | S | R |
| CS76123-21 | M B | R | R | G | M | A | E | F | G | A | S | S | S |
| CS76148-18 | M W | R | R | E | A | U | U | F | A | E | R | S | S |
| CS7958-1 | M W | O | O | E | A | U | U | F | G | E | S | M | S |
| CS7910-6 | ML C | R | R | G | F | A | A | F | G | E | R | S | R |
| Full Season | | | | | | | | | | | | | |
| Campbell 14 | ML W | OR | OR | E | A | A | G | G | A | A | S | S | S |
| BR7088-18 | ML C | R | R | G | A | A | E | F | G | M | S | M | S |
| CS7635-4 | L W | R | R | E | A | A | G | F | A | A | R | R | S |
| CS76123-36 | L WC | OR | OR | E | A | U | A | F | G | E | R | M | S |
| CS7910-6 | ML WC | R | R | A | A | M | A | F | G | E | R | R | R |
| CS7684-9 | M C | RO | RO | G | F | M | M | F | A | A | R | S | R |
| Russet tablestock | | | | | | | | | | | | | |
| CS77120-8 | M LR | RO | RO | E | A | M | G | F | E | U | M | S | S |
| CS7837-19 | M R | O | O | G | F | U | G | F | E | A | F | R | R |

Maine Table 2. Continued

Resistance to 5/

| Pedigree | Maturity ^{1/} | Skin color ^{2/} | Tuber type ^{3/} | Yield ^{4/} | Cooked quality ^{4/} | Chtp color ^{4/} | Percent dry matter ^{4/} | Storage qualities ^{4/} | Brusting ^{4/} | Hollow Heart ^{4/} | Virus X | Leafroll | Net necrosis | Late blight | Early blight | Acid scab | Common scab | Verticillium | Golden nematode |
|----------|------------------------|--------------------------|--------------------------|---------------------|------------------------------|--------------------------|----------------------------------|---------------------------------|------------------------|----------------------------|---------|----------|--------------|-------------|--------------|-----------|-------------|--------------|-----------------|
|----------|------------------------|--------------------------|--------------------------|---------------------|------------------------------|--------------------------|----------------------------------|---------------------------------|------------------------|----------------------------|---------|----------|--------------|-------------|--------------|-----------|-------------|--------------|-----------------|

Long white for processing or count box

| | | | | | | | | | | | | | | | | | | | |
|-----------|----|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CS7981-7 | M | C | OL | E | A | M | G | F | G | G | S | R | R | S | S | S | S | R | S |
| CS7849-3 | ML | W | O | G | F | G | E | F | E | G | F | F | R | M | M | R | R | M | R |
| CS78188-1 | M | W | OR | E | F | M | E | F | G | G | F | F | R | S | S | M | M | M | F |
| CS7984-3 | M | W | OL | A | F | A | E | F | G | U | S | S | R | S | S | R | M | M | S |

Chipping type

| | | | | | | | | | | | | | | | | | | | |
|------------|----|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CS7232-4 | ME | WC | RO | U | G | E | G | F | A | E | S | S | R | S | S | M | M | S | S |
| AS443-1 | ME | DC | RO | M | F | G | E | F | M | M | F | F | R | S | M | S | S | M | F |
| CD23-1 | ML | C | R | M | F | G | E | F | A | A | R | S | R | S | S | M | S | S | R |
| CS78162-12 | M | C | R | M | F | A | G | F | G | G | F | F | R | S | S | S | S | S | R |
| CS78289-1 | ME | C | RO | A | F | A | G | F | E | G | F | F | M | S | S | R | M | M | R |

1/ E = early, M = medium, L = late.2/ W = white, C = cream, Y = yellow, B = buff, R = russet, Pu = purple, Re - red, L = light, D = dark.3/ R = round, O = oblong, L = long.4/ Rated as U = unacceptable, M = marginal, A = acceptable, G = good, E = excellent, F = further testing needed.5/ R = resistant, M = moderately resistant, S = susceptible, F = further testing needed.

MICHIGAN

R.W. Chase, R.B. Kitchen, R. Leep and R. Hammerschmidt

DATES-OF-HARVEST

The 1985 dates-of-harvest study was conducted at the Montcalm Research Farm with 22 varieties and numbered selections. Three complete plantings of all varieties were made on May 7 in plots 23 ft x 34 inches and 12 inch plant spacings within the row. There were 4 replications and harvests were made on August 7 (92 days), August 29 (114 days) and September 19 (135 days) after planting.

The previous crop was corn and a winter rye cover crop. Fertilizers used were 400 lbs/A 0-0-60 plowdown, 500 lbs/A 24-8-8 in the planter and 180 lbs/A of 46-0-0 sidedressed. Aldicarb (Temik 15G) was applied at 20 lbs/A at planting. The sidedress application of urea, hilling and herbicide application were all made just as the potatoes were emerging which was done on May 28. Immediately after hilling, a tank mix of Dual at 2 lbs/A plus Lexone at $\frac{1}{2}$ lb/A were applied for weed control and no further tillage was performed until harvest. The plots were irrigated and foliar insecticides and fungicides were applied as needed.

Results

Tables 1, 2 and 3 provide the yield and size distribution and quality results for each of the harvest dates. In general, yields were very good. As observed in previous years, the overall average specific gravity readings were lower on the third date of harvest than on the second harvest. Weather conditions were generally favorable through the growing season except that rainfall during May and June were below the average. Average maximum and minimum temperatures were 5F above average during both April and May and 4F below average during June and August. Temperatures were close to the 15 year average for both July and September.

Table 4 summarizes the culinary quality of after-cooking-darkening which was conducted on December 2. Peeled halves of 3 tubers selected at random and cooked uniformly in steam were evaluated at 0, 1 and 24 hours for tuber darkening. The incidence of any severe after-cooking-darkening was minimal.

Early blight was very prevalent in many varieties by late July and at that point, fungicide applications appeared to do little to arrest the problem. Conestoga yields were well below previous years data and seemed to result from a poor stand and weak growth of the remaining plants. In the 1984 trials this variety produced over 350 cwt/A at all three dates-of-harvest. Severe air check was observed on the G670-11 particularly at the first two dates-of-harvest. At the first date of harvest air checking was also noted on MS700-79, Simcoe, B9140-32 and MS702-91. The incidence was much less on the August 29 and September 19 harvests.

The internal defects were very minimal with almost no internal necrosis in any selection. Hollow heart was also judged to be very minimal. Pink eye was noted on some selections particularly on the last two dates of harvest.

Samples of all selections were collected from the third date of harvest for subsequent storage studies at both 53F and 40F and boiling studies for after-cooking-darkening and chip studies will be conducted later.

Variety
Observations

MS700-79 - mid-season maturity, round white with average yields and medium specific gravity. Good scab tolerance.

MS700-83 - mid-season maturity, above average yields and good general appearance. Good internal quality and does chip out of field. Some scab tolerance.

MS701-22 - mid-season maturity, average yields, produces high percentage of potatoes over 3 $\frac{1}{4}$ ".

MS702-80 - medium-early variety, slightly below average yields. Good scab tolerance and chips well.

MS702-91 - medium-late maturity, with high yield potential. Low internal defects and good chips. Some variation in tuber shape from round to oblong.

MS704-10 - medium maturity and golden flesh. Sets heavy with average yields. High specific gravity.

MS716-15 - medium late maturity and below average yields. Well shaped, smooth and excellent general appearance.

G670-11 - late maturing, round white with high yield potential. Tubers susceptible to hollow heart, scab, shatter bruise and growth crack.

Acadia Russet - late maturing, long russet with average yields. Medium specific gravity. Fair in general appearance. Susceptible to scab.

Alasclear - late maturity, average yields, elongated shape. General tuber shape and appearance variable and not uniform. Good scab tolerance and medium specific gravity.

Atlantic - round white and above average yields. Good chip quality and high specific gravity.

Carlton - late maturity, round white for tablestock. Low specific gravity. Below average yields except at first harvest. Severe scab at Lake City Experiment Station seed increase plot.

Conestoga - early maturing, round white. Poor stands resulted in low yields. Medium deep eye. Some susceptibility to scab. Produced average yields in 1984.

Islander - late maturing, elongated white with below average yields. Good scab tolerance.

Onaway - early maturing, round white with good yields.

Russet Burbank - good yields but low percent No. 1's. High percentage of under 4 ounce potatoes and deformed tubers.

Shepody - long white, medium-late maturity with above average yields. Higher percentage of U.S. No. 1 than Russet Burbank. Comparable to Russet Burbank in specific gravity. Matures 2-3 weeks earlier than Russet Burbank. Good french fries and possible count pack. Susceptible to scab.

Simcoe - medium-early maturity but below average yield. Good chip color.

Yankee Chipper - medium-late maturity, oblong white. Average yields, medium specific gravity. Some scab susceptibility.

Yankee Supreme - medium-late, oblong to blocky tuber with slight netting. Sets and sizes tubers early but susceptible to scab.

Yukon Gold - medium-early, smooth tubers, shallow eye and golden flesh. Susceptible to scab. Above average yields and suitable for specialty fresh pack.

B9140-32 - medium maturing, oblong russet. Low yields at all dates of harvest.

UPPER PENINSULA TRIAL

A potato variety trial was conducted in Delta County, Michigan on the John VerBrigghe farm. Each variety was replicated four times in a randomized block experimental design. The plots were planted on May 24 and harvested on October 2, 1985. Yields, specific gravity and internal defects were determined.

The plot area was fertilized with a total of 105-72-120 pounds per acre of fertilizer. The soil test was pH - 6.5, P - 107 and K - 107. The previous crop was alfalfa. Thimet was applied at planting. Lexone was applied at 0.25 lbs/A postemergence for weed control. The plots were irrigated and managed as the entire field was. Favorable growing conditions resulted in excellent yields with good quality.

Results

The total yield ranged from 291 and 618 hundredweight per acre (Table 5). The average total yield over 24 varieties was 395 hundredweight per acre. Yields of G670-11, Acadia Russet, Russet Burbank and MS716-15 were significantly higher than the average. Specific gravity ranged from 1.068 to 1.084 with the average at 1.075. Hollow heart was found in G670-11, however, only a small percentage of tubers contained hollow heart. The overall appearance and quality of the tubers was excellent which was probably due to excellent growing conditions.

NORTHEAST REGIONAL
TRIAL

Several selections were obtained from the Sangerville Farm in Maine where seed is maintained for several selections from the Northeast potato breeding programs. Most of the selections were selected for a high tolerance to scab. Included in the study were four russet selections. NorKing Russet was released in 1985 by North Dakota and ND534-4 is another very smooth and promising russet. Nooksack which has a very long dormancy and A74114-4 from the USDA-Aberdeen program were also included.

Plot dimensions, fertilizers and irrigation pest management were similar to the dates-of-harvest study. The plots were planted on May 8, 1985 and harvested on September 20 (135 days).

Results

Table 6 summarizes the yield and size distribution data for the several cultivars in the Northeast trial. Selections showing the greatest internal defects were AF339-5, Nooksack, ND534-4, CS77120-8 and CS73105-2R. Selections judged to have the best overall general appearance were CF7750-1, Tolaas (MN7973), NorKing Russet, ND534-4, A74114-4 and Atlantic.

Variety
Observations

BR7088-18 - smooth round white with deep eyes, medium-late maturity, vigorous and good stand.

NY64 - late maturing, round white, scab and golden nematode resistance, good stands and vigorous.

A74114-4 - a long russet from USDA-Aberdeen program. Late maturity, good stand and vigor, good general appearance, one hollow heart and 3 with internal necrosis, trace of scab and some growth crack.

AF92-3 - medium-late maturity, round to oblong white, not uniform in tuber shape, some scab tolerance, good vigorous stand, no early blight noted and trace of growth crack.

Atlantic - good, vigorous stand, trace of scab and growth crack, one hollow heart.

NorKing Russet - very smooth, long russet, medium-late maturity and a vigorous growth, considerable early blight on foliage on August 12.

CS77120-8 - medium maturity, oval to oblong russet, considerable hollow heart and brown center, low specific gravity.

AF339-5 - medium-late maturity, oblong and flattened white tubers, uneven growth and average vigor, considerable hollow heart and some growth crack and vascular discoloration.

MN7973 (TOLAAS) - medium maturity, long white (sometimes russet), resistance to hollow heart and scab, high tolerance to late blight, smooth and good general appearance, trace growth crack. Showed some wilted stems in August, maybe blackleg.

AF9058-M - late maturing, oval white tubers, irregular in shape, some scab and internal necrosis, very uneven stand and poor vigor.

CS73105-2R - medium maturity, oblong russet, considerable vascular discoloration, good stand with average vigor.

ND534-4 - medium maturity, oblong to long russet, very smooth, lower specific gravity than NorKing Russet, good stand, many dead stalks in early August, some hollow heart and considerable internal necrosis.

WF564-3 (MAVERICK) - medium-late maturity, round to blocky russet, low specific gravity, has prominent eyebrows, resistant to scab, minimal internal defects, good stand and vigorous growth.

Russet Burbank - good total yield but poor sizing and 20% pick outs, minimal internal defects, good stand and vigorous growth.

CF76183-2 - early maturity, oblong white, trace of scab and growth crack, low specific gravity, good stand with average vigor.

CF7750-1 - medium-early maturity, oblong light russet, minimal internal defects, several black scurf and skin spots, small weak plants and average vigor.

Nooksack - late maturity, long russet, long dormancy, trace hollow heart, severe vascular discoloration, good stand with vigorous growth.

**NORTH CENTRAL
REGIONAL TRIAL**

Eighteen selections from seven mid-west potato breeding programs were compared with five check varieties in the 1985 North Central Regional Trial. Plots were planted on May 8 and harvested on September 23. Plot size, fertilizers and pest management were the same as for the dates-of-harvest study.

Results

Three MSU seedlings, MS700-83, MS704-10 and MS716-15 were included in the regional trial. Also included was G670-11, a selection developed at the University of Guelph. Tables 7 and 8 summarize the performance data. Yields in general were very good with eight selections exceeding 400 cwt/A. The incidence of scab was not serious except for selection NE106. Selections G670-11 and BN9815-3 had a moderate level of scab. Internal defects were also minimal except for hollow heart in G670-11 and BN9815-3. The three MSU seedlings performed very well with MS700-83 producing very good yields and was judged as the first choice for the merit rating.

BELTSVILLE TRIAL

Thirteen selections from the USDA-Beltsville potato breeding program were evaluated in comparison to Atlantic. The plots were planted on May 8 and harvested on September 10 (125 days). Plot size, fertilizers and pest management were the same as for the dates of harvest study.

Results

Several selections yielded below the accepted level of at least 300 cwt/A and several selections had a low percentage of U.S. No. 1's (Table 9). In most instances the tubers did not size adequately as evidenced by the high percentage of tubers under 2 inches. Selections WF31-4, WF46-3 and WF46-4 are white-flower siblings of Atlantic and all yielded very comparable to Atlantic. In tests to date, they have not exhibited any superior characteristics when compared to Atlantic. Selection B6887-3(Y) is a golden flesh variety which is oblong in shape and many tubers were pear shaped.

Michigan Table 1. First Date-of-Harvest Yield Results (92 days). Harvested August 7, 1985.

| Variety | Yield cwt/A | | Percent Size Distribution | | | | | Internal Defects* | | | | |
|-----------------|-------------|-------|---------------------------|----------|------|---------|-----------|-------------------|-------------|----|-------------|---------------|
| | Total | No. 1 | No. 1 | Under 2" | 2-3½ | Over 3½ | Pick Outs | Specific Gravity | Chip Rating | HH | Vas. Dis. | Int. Necrosis |
| Onaway | 424 | 388 | 91 | 7 | 78 | 13 | 2 | 1.062 | 3.5 | 0 | 3 sl | 0 |
| MS702-91 | 389 | 346 | 89 | 10 | 81 | 8 | 1 | 1.078 | 1.0 | 0 | 1 sl | 0 |
| MS700-83 | 389 | 335 | 86 | 14 | 76 | 10 | 0 | 1.072 | 1.0 | 0 | 1 sl | 0 |
| Atlantic | 355 | 301 | 85 | 14 | 73 | 12 | 1 | 1.082 | 1.0 | 0 | 0 | 0 |
| Yukon Gold | 331 | 291 | 88 | 10 | 71 | 17 | 2 | 1.077 | 1.0 | 0 | 2 sl | 0 |
| Carlton | 321 | 289 | 91 | 8 | 69 | 22 | 1 | 1.062 | 2.5 | 0 | 3 sl | 0 |
| MS704-10(Y) | 333 | 283 | 85 | 14 | 77 | 8 | 1 | 1.080 | 1.5 | 0 | 0 | 0 |
| MS700-79 | 314 | 281 | 89 | 9 | 82 | 7 | 2 | 1.080 | 1.0 | 1 | 1 sl | 0 |
| MS701-22 | 308 | 281 | 91 | 8 | 78 | 13 | 1 | 1.077 | 1.0 | 0 | 0 | 0 |
| Yankee Supreme | 326 | 275 | 84 | 12 | 77 | 7 | 4 | 1.077 | 1.5 | 0 | 1 sl | 0 |
| Alasclear | 334 | 269 | 81 | 15 | 78 | 3 | 4 | 1.075 | 1.5 | 0 | 3 sl | 0 |
| Islander | 323 | 255 | 79 | 20 | 78 | 1 | 1 | 1.077 | 1.0 | 0 | 0 | 0 |
| MS702-80 | 293 | 255 | 87 | 12 | 79 | 8 | 1 | 1.073 | 1.0 | 0 | 0 | 0 |
| Yankee Chipper | 331 | 249 | 75 | 23 | 72 | 3 | 2 | 1.078 | 1.0 | 0 | 0 | 0 |
| G670-11 | 287 | 245 | 85 | 8 | 71 | 14 | 7 | 1.082 | 2.0 | 1 | 1 sl | 0 |
| MS716-15 | 277 | 235 | 85 | 15 | 79 | 6 | 0 | 1.086 | 1.0 | 0 | 0 | 0 |
| B9140-32 | 269 | 227 | 84 | 14 | 81 | 3 | 2 | 1.082 | 1.0 | 1 | 1 sl, 1 sev | 0 |
| Shepody | 272 | 218 | 80 | 17 | 65 | 15 | 3 | 1.072 | 2.5 | 0 | 2 sl | 0 |
| Simcoe | 243 | 216 | 89 | 11 | 84 | 5 | 0 | 1.079 | 1.0 | 0 | 0 | 0 |
| Russet Burbank | 291 | 203 | 70 | 20 | 64 | 6 | 10 | 1.065 | 2.5 | 0 | 1 sl | 0 |
| Acadia Russet | 288 | 199 | 69 | 29 | 68 | 1 | 2 | 1.076 | 2.5 | 0 | 2 sl | 0 |
| Conestoga | 213 | 166 | 78 | 20 | 70 | 8 | 2 | 1.071 | 1.5 | 1 | 1 sl | 0 |
| OVERALL AVERAGE | 301 | 264 | | | | | | 1.076 | | | | |

*20 tubers at random cut.

Michigan Table 2. Second Date-of-Harvest Yield Results (114 days). Harvested August 29, 1985.

| Variety | Yield-cwt/A | | Percent Size Distribution | | | | | | Internal Defects* | | | | |
|-----------------|-------------|-------|---------------------------|-------------|------|------------|--------------|---------------------|-------------------|----|-----------|-------------|------------------|
| | Total | No. 1 | No. 1 | Under 2" | 2-3¼ | Over 3¼ | Pick Outs | Specific Gravity | Chip Rating | HH | Vas. Dis. | | Int. Necrosis |
| | | | | | | | | | | | | | |
| G670-11 | 508 | 448 | 88 | 5 | 52 | 36 | 7 | 1.090 | 2.0 | 0 | | 1 s1 | 0 |
| MS700-83 | 502 | 434 | 86 | 13 | 72 | 14 | 1 | 1.076 | 1.0 | 0 | | 3 s1 | 0 |
| Russet Burbank | 446 | 340 | 76 | 14 | 63 | 13 | 10 | 1.079 | 2.0 | 0 | | 4 s1 | 0 |
| Shepody | 440 | 380 | 86 | 6 | 64 | 22 | 8 | 1.077 | 1.5 | 0 | | 4 s1 | 0 |
| Onaway | 436 | 400 | 91 | 8 | 74 | 17 | 1 | 1.064 | 3.5 | 0 | | 7 s1 | 0 |
| Atlantic | 429 | 371 | 86 | 11 | 64 | 22 | 3 | 1.087 | 1.0 | 0 | | 1 s1 | 0 |
| Islander | 417 | 354 | 85 | 13 | 75 | 6 | 2 | 1.076 | 1.0 | 0 | | 0 | 0 |
| MS701-22 | 407 | 385 | 94 | 5 | 60 | 34 | 1 | 1.083 | 1.0 | 0 | | 0 | 0 |
| MS702-91 | 405 | 353 | 88 | 11 | 77 | 11 | 1 | 1.077 | 1.0 | 0 | | 4 s1 | 0 |
| Yankee Chipper | 403 | 314 | 78 | 20 | 72 | 6 | 2 | 1.078 | 1.5 | 0 | | 6 s1 | 0 |
| MS700-79 | 395 | 366 | 92 | 6 | 79 | 13 | 2 | 1.079 | 1.0 | 0 | | 0 | 0 |
| Acadia Russet | 391 | 318 | 81 | 18 | 73 | 8 | 1 | 1.077 | 2.5 | 1 | | 2 s1 | 0 |
| Alasclear | 389 | 331 | 85 | 12 | 82 | 3 | 3 | 1.080 | 2.0 | 0 | | 6 s1 | 0 |
| Yukon Gold | 383 | 348 | 90 | 9 | 75 | 15 | 1 | 1.079 | 1.5 | 0 | | 2 s1 | 0 |
| MS704-10 | 366 | 318 | 86 | 12 | 71 | 15 | 2 | 1.083 | 1.5 | 0 | | 3 s1 | 0 |
| Yankee Supreme | 353 | 300 | 85 | 14 | 79 | 6 | 1 | 1.074 | 2.0 | 1 | | 1 sev | 0 |
| MS702-80 | 330 | 288 | 87 | 12 | 82 | 5 | 1 | 1.073 | 1.0 | 0 | | 1 s1, 1 sev | 0 |
| Simcoe | 329 | 300 | 90 | 9 | 80 | 11 | 0 | 1.080 | 1.0 | 0 | | 0 | 0 |
| MS716-15 | 308 | 262 | 8 | 15 | 79 | 6 | 0 | 1.085 | 1.0 | 0 | | 0 | 0 |
| B9140-32 | 297 | 251 | 84 | 15 | 80 | 4 | 1 | 1.084 | 1.0 | 0 | | 2 s1 | 0 |
| Carlton | 261 | 236 | 90 | 10 | 75 | 15 | 0 | 1.060 | 2.5 | 0 | | 4 s1 | 0 |
| Conestoga | 228 | 189 | 83 | 16 | 72 | 11 | 1 | 1.069 | 1.0 | 0 | | 1 s1 | 0 |
| OVERALL AVERAGE | 383 | 331 | | | | | | 1.078 | | | | | |

*20 tubers at random cut.

Michigan Table 3. Third Date-of-Harvest Yield Results (135 days). Harvested September 19, 1985.

| Variety | Yield-cwt/A | | Percent Size Distribution | | | | | Internal Defects* | | | | |
|-----------------|-------------|-------|---------------------------|-------------|-------|-------------|--------------|---------------------|----------------|----|--------------|------------------|
| | Total | No. 1 | No. 1 | Under 2" | 2-3½" | Over 3½" | Pick Outs | Specific Gravity | Chip Rating | HH | Vas. Dis. | Int. Necrosis |
| G670-11 | 659 | 592 | 90 | 3 | 44 | 46 | 7 | 1.085 | 2.5 | 3 | 0 | 0 |
| MS702-91 | 560 | 527 | 94 | 5 | 69 | 25 | 1 | 1.077 | 1.0 | 0 | 1 sl | 0 |
| Atlantic | 520 | 474 | 91 | 6 | 67 | 24 | 3 | 1.087 | 1.0 | 0 | 1 sl, 1 sev | 0 |
| Russet Burbank | 520 | 306 | 59 | 16 | 39 | 20 | 25 | 1.077 | 2.0 | 1 | 1 sl | 0 |
| Onaway | 494 | 466 | 92 | 6 | 70 | 22 | 2 | 1.061 | 3.5 | 0 | 4 sl | 0 |
| MS700-83 | 453 | 396 | 88 | 10 | 63 | 25 | 2 | 1.073 | 1.0 | 0 | 0 | 0 |
| Yukon Gold | 440 | 409 | 93 | 4 | 66 | 27 | 3 | 1.073 | 2.0 | 1 | 1 sl | 0 |
| Shepody | 438 | 320 | 74 | 17 | 57 | 17 | 9 | 1.077 | 1.5 | 0 | 1 sl | 0 |
| Alasclear | 409 | 325 | 80 | 16 | 69 | 11 | 4 | 1.077 | 1.5 | 0 | 3 sl | 0 |
| Acadia Russet | 407 | 287 | 71 | 26 | 65 | 6 | 3 | 1.075 | 3.0 | 0 | 2 sl, 2 sev | 0 |
| MS701-22 | 400 | 388 | 97 | 3 | 49 | 48 | 0 | 1.080 | 1.5 | 0 | 0 | 0 |
| MS704-10 | 400 | 360 | 90 | 10 | 77 | 13 | 0 | 1.075 | 1.5 | 0 | 3 sl | 0 |
| Yankee Chipper | 385 | 314 | 81 | 16 | 75 | 6 | 3 | 1.076 | 1.0 | 0 | 4 sl | 0 |
| MS700-79 | 377 | 354 | 94 | 5 | 79 | 15 | 1 | 1.076 | 1.0 | 0 | 0 | 0 |
| Yankee Supreme | 377 | 329 | 87 | 9 | 72 | 15 | 4 | 1.073 | 2.0 | 0 | 2 sl | 0 |
| MS716-15 | 372 | 338 | 91 | 9 | 81 | 10 | 0 | 1.083 | 1.0 | 0 | 0 | 0 |
| Simcoe | 363 | 342 | 94 | 5 | 80 | 14 | 1 | 1.076 | 1.0 | 0 | 1 sl | 0 |
| Carlton | 361 | 321 | 89 | 8 | 62 | 27 | 3 | 1.058 | 2.5 | 0 | 0 | 0 |
| Islander | 349 | 291 | 84 | 14 | 77 | 7 | 2 | 1.077 | 1.0 | 0 | 4 sl | 0 |
| MS702-80 | 342 | 311 | 91 | 8 | 79 | 12 | 1 | 1.073 | 1.0 | 0 | 2 sl | 0 |
| B9140-32 | 334 | 294 | 88 | 11 | 81 | 7 | 1 | 1.080 | 1.0 | 0 | 1 sev | 0 |
| Conestoga | 237 | 196 | 83 | 14 | 77 | 6 | 3 | 1.071 | 1.0 | 0 | 1 sl | 0 |
| OVERALL AVERAGE | 418 | 361 | | | | | | 1.075 | | | | |

*20 tubers at random cut.

Michigan Table 4. After-Cooking-Darkening of 22 varieties grown in 1985 Dates-of-Harvest Study*.

| | 0 Hours | 1 Hour | 24 Hours | Comments |
|----------------|---------|--------|----------|--|
| MS700-79 | 1.0 | 1.5 | 1.5 | some sloughing, 2 tubers with darkened stem end. |
| MS700-83 | 1.5 | 1.5 | 1.5 | 3 slightly darkened stem end. |
| MS701-22 | 1.0 | 1.0 | 1.5 | some sloughing. |
| MS702-80 | 1.0 | 1.0 | 1.0 | |
| MS702-91 | 1.0 | 1.0 | 1.0 | some sloughing. |
| MS704-10 | 1.0 | 1.0 | 1.0 | |
| MS716-15 | 1.0 | 1.0 | 1.0 | some sloughing. |
| G670-11 | 1.0 | 1.0 | 1.0 | |
| Acadia Russet | 1.0 | 1.0 | 1.0 | |
| Alasclear | 1.0 | 1.0 | 1.0 | |
| Atlantic | 1.0 | 1.0 | 1.0 | some sloughing. |
| Carlton | 1.0 | 1.0 | 1.0 | |
| Conestoga | 1.0 | 1.5 | 2.0 | 3 with darkened stem ends. |
| Islander | 1.5 | 2.0 | 2.0 | dark over all. |
| Onaway | 1.0 | 2.0 | 2.0 | dark over all. |
| Russet Burbank | 1.0 | 1.0 | 1.0 | |
| Shepody | 1.0 | 1.0 | 1.0 | some sloughing. |
| Simcoe | 1.0 | 1.0 | 1.0 | 1 with darkened stem end. |
| Yankee Chipper | 1.5 | 2.0 | 2.5 | dark all over. |
| Yankee Supreme | 1.0 | 1.0 | 1.0 | 1 tuber with darkened stem end. |
| Yukon Gold | 1.0 | 1.0 | 1.0 | 1 tuber with darkened stem end. |
| B9140-32 | 1.0 | 1.5 | 2.0 | some sloughing. |

*Tubers stored at 53F since harvest. Rating scale 1-5; 1 = no darkening, 5 = severe darkening overall.

Michigan Table 5. The Yield, Size Distribution and Specific Gravity of Several Potato Varieties Grown in the Upper Peninsula.

| Variety | cwt/A | | Percent Size Distribution | | | | | S.G. |
|----------------|------------|------------|---------------------------|-----|---------------------|--------------------|-----------|--------------|
| | Total | No. 1 | No. 1 | <2" | 2-3 $\frac{1}{4}$ " | >3 $\frac{1}{4}$ " | Pick Outs | |
| Acadia Russet | 618 | 554 | 90 | 11 | 53 | 36 | 0 | 1.073 |
| G670-11 | 492 | 479 | 97 | 3 | 49 | 48 | 0 | 1.084 |
| MS716-15 | 492 | 456 | 93 | 2 | 63 | 30 | 0 | 1.081 |
| Russet Burbank | 521 | 451 | 87 | 11 | 70 | 17 | 2 | 1.079 |
| MS702-91 | 456 | 427 | 94 | 6 | 55 | 38 | 0 | 1.070 |
| Shepody | 439 | 415 | 95 | 5 | 41 | 53 | 0 | 1.074 |
| Alasclear | 438 | 408 | 93 | 7 | 75 | 18 | 0 | 1.074 |
| ND534-4 | 446 | 398 | 89 | 10 | 56 | 34 | 1 | 1.069 |
| MS704-10 | 436 | 380 | 87 | 13 | 64 | 23 | 0 | 1.074 |
| Carlton | 435 | 378 | 87 | 5 | 34 | 51 | 10 | 1.068 |
| Conestoga | 382 | 352 | 92 | 8 | 73 | 19 | 0 | 1.071 |
| NorKing Russet | 390 | 337 | 86 | 13 | 80 | 6 | 1 | 1.078 |
| Atlantic | 368 | 332 | 90 | 9 | 71 | 19 | 0 | 1.083 |
| MS700-79 | 346 | 331 | 96 | 5 | 58 | 37 | 0 | 1.076 |
| Yankee Supreme | 351 | 328 | 93 | 6 | 62 | 31 | 1 | 1.078 |
| MS700-83 | 405 | 325 | 80 | 20 | 60 | 20 | 0 | 1.070 |
| Nooksack | 324 | 313 | 97 | 3 | 54 | 43 | 0 | 1.081 |
| Yukon Gold | 313 | 300 | 96 | 4 | 46 | 50 | 0 | 1.074 |
| Superior | 313 | 274 | 88 | 13 | 73 | 13 | 0 | 1.070 |
| Simcoe | 286 | 271 | 95 | 5 | 69 | 25 | 0 | 1.080 |
| MS702-80 | 306 | 270 | 88 | 12 | 60 | 28 | 0 | 1.070 |
| MS701-22 | 300 | 263 | 88 | 12 | 53 | 35 | 0 | 1.081 |
| Yankee Chipper | 329 | 253 | 77 | 23 | 68 | 9 | 0 | 1.077 |
| Islander | <u>291</u> | <u>214</u> | 74 | 32 | 64 | 3 | 0 | <u>1.072</u> |
| AVERAGE | 395 | 355 | | | | | | 1.075 |

Michigan Table 6. The Yield, Size Distribution and Specific Gravity of Several Potato Cultivars Grown in the Northeast Regional Trial.

| Variety | cwt /A | | Percent Size Distribution | | | | | S.G. |
|--------------------|------------|------------|---------------------------|-----|-------|------|-----------|--------------|
| | Total | No.1 | No. 1 | <2" | 2-3¼" | >3¼" | Pick Outs | |
| BR7088-18 | 429 | 391 | 91 | 5 | 67 | 24 | 4 | 1.087 |
| NY64 | 459 | 381 | 83 | 10 | 66 | 17 | 7 | 1.072 |
| A74114-4 | 447 | 378 | 85 | 12 | 63 | 22 | 3 | 1.075 |
| AF92-3 | 415 | 364 | 88 | 9 | 65 | 23 | 3 | 1.068 |
| Atlantic | 442 | 357 | 81 | 14 | 67 | 14 | 5 | 1.086 |
| NorKing Russet | 420 | 331 | 79 | 16 | 63 | 16 | 5 | 1.080 |
| CS77120-8 | 381 | 310 | 81 | 8 | 57 | 24 | 11 | 1.067 |
| AF339-5 | 342 | 289 | 85 | 5 | 32 | 52 | 11 | 1.076 |
| MN7973 (TOLAAS) | 326 | 287 | 88 | 7 | 68 | 20 | 5 | 1.063 |
| AF9058M | 334 | 271 | 81 | 9 | 48 | 33 | 10 | 1.069 |
| CS73105-2R | 310 | 266 | 86 | 12 | 73 | 13 | 2 | 1.067 |
| ND534-4 | 326 | 264 | 81 | 13 | 58 | 23 | 6 | 1.070 |
| WF564-3 (MAVERICK) | 399 | 260 | 65 | 29 | 60 | 5 | 6 | 1.066 |
| Russet Burbank | 405 | 251 | 62 | 18 | 52 | 10 | 20 | 1.079 |
| CF76183-2 | 288 | 228 | 79 | 15 | 60 | 19 | 6 | 1.063 |
| CF7750-1 | 247 | 203 | 82 | 18 | 70 | 12 | 0 | 1.073 |
| Nooksack | <u>232</u> | <u>180</u> | <u>78</u> | 20 | 73 | 4 | 3 | <u>1.090</u> |
| AVERAGE | 364 | 294 | 81 | | | | | 1.073 |

Michigan Table 7. Yield, Solids, Maturity and Chip Quality of Several Cultivars Grown in the North Central Regional Trial.

| Selection Number or Variety | Aver. Mat. | 1 Representa- tive Scab Area-Type | Most ² | | CWT/A | | Aver. Yield US #1 | Aver. Percent US #1 | Aver. Total Solids | Gen. ³ Merit Rating | Chip Color | Comments and General Notes |
|--------------------------------|---------------|--|-------------------|---|-------|-----|-------------------------|---------------------------|--------------------------|--------------------------------------|---------------|-------------------------------|
| | | | 2 | 3 | 4 | 5 | | | | | | |
| <u>EARLY TO MEDIUM EARLY</u> | | | | | | | | | | | | |
| Norland | 1 | 0 | | | 341 | 314 | 92 | 15.0 | | | 2.0 | growth cracks. |
| MN 11705 | 1 | 0 | | | 166 | 72 | 43 | 16.9 | | | 1.0 | pear shape; short dor. |
| NE 9.75-1 | 2 | 1-3 | | | 437 | 379 | 87 | 17.5 | | | 1.5 | knobs; growth crack. |
| ND 651-9 | 2 | T-3 | | | 343 | 286 | 83 | 17.7 | | | 1.0 | sl. knobs. |
| ND 860-2 | 1 | 0 | | | 202 | 137 | 68 | 18.4 | | | 1.0 | |
| <u>MEDIUM TO LATE</u> | | | | | | | | | | | | |
| La 12-59 | 4 | 0 | | | 414 | 392 | 95 | 18.8 | | | 2.0 | |
| La 01-38 | 4 | 0 | | | 480 | 463 | 96 | 19.2 | | 4 | 2.0 | |
| MS700-83 | 3 | 0 | | | 464 | 423 | 91 | 19.2 | | 1 | 1.0 | |
| MS704-10 | 3 | 0 | | | 389 | 351 | 93 | 20.3 | | | 1.5 | sl. growth crack. |
| MS716-15 | 4 | T-3 | | | 375 | 330 | 88 | 20.9 | | 2 | 1.0 | |
| G670-11 | 5 | 2-3 | | | 493 | 445 | 90 | 21.8 | | | 2.0 | growth crack. |
| MN 11816 | 3 | 0 | | | 173 | 129 | 74 | 17.1 | | 3 | 2.0 | sl. knobs. |
| MN 11903 | 3 | T-3 | | | 320 | 290 | 91 | 16.7 | | | 1.5 | sl. pointed. |
| NE 106 | 4 | 5-2 | | | 382 | 334 | 87 | 19.4 | | | 1.5 | sl. growth crack. |
| BN 9815-3 | 3 | 2-3 | | | 222 | 199 | 90 | 18.8 | | | 2.0 | |
| ND671-4Russ | 3 | 1-3 | | | 367 | 252 | 69 | 18.0 | | 5 | 3.5 | growth crack. |
| W 842 | 4 | T-2 | | | 387 | 345 | 89 | 22.0 | | | 1.0 | sl. growth crack, pointed. |
| W 903 | 3 | 0 | | | 452 | 348 | 77 | 17.5 | | | 2.0 | pear shape. |
| W 949R | 3 | T-3 | | | 435 | 413 | 95 | 16.7 | | | 3.0 | |
| Red Pontiac | 3 | 0 | | | 580 | 509 | 88 | 15.6 | | | 3.5 | knobs. |
| Russet Burbank | 4 | 0 | | | 383 | 245 | 64 | 19.4 | | | 3.0 | |
| Norgold Russet | 3 | 0 | | | 273 | 153 | 56 | 17.1 | | | 3.5 | sl. knobs. |
| Norchip | 3 | 0 | | | 317 | 277 | 88 | 19.2 | | | 1.0 | growth crack. |

¹ 1-Very Early-Norland maturity; 2-Early-Irish Cobbler maturity; 3-Medium-Red Pontiac maturity; 4-Late-Katahdin maturity; 5-Very Late-Kennebec or Russet Burbank maturity.

² AREA - T-less than 1%; 1 - 10-20%; 2 - 21-40%; 3 - 41-60%; 4 - 61-80%; 5 - 81-100%. TYPE - 1. Small, superficial; 2. Larger, superficial; 3. Larger, rough pustules; 4. Larger pustules, shallow holes; 5. Very large pustules, deep holes.

³ Place top five among all entries including check varieties; disregard maturity classification. (Rate first, second, third, fourth and fifth (in order) for overall worth as a variety).

⁴ Chip Color - PCII Color Chart or Agron. 1-5 scale.

Michigan Table 8. Summary of External and Internal Grade Defects of North Central Regional Trial.

| Selection Number or Variety | EXTERNAL DEFECTS (1) | | | | Total (3) Tubers Free of External Defects | INTERNAL DEFECTS (1) | | | Normal Tubers (4) |
|--------------------------------|----------------------|------------------|------------------|--------------|--|----------------------|----------------------|--------------|----------------------|
| | Scab (2) | Growth Cracks | Second Growth | Sun Green | | Hollow Heart | Internal Necrosis | Vas. Dis. | |
| EARLY TO MEDIUM EARLY | | | | | | | | | |
| Norland | 0 | 0 | 0 | 2 | 98 | 0 | 0 | 0 | 100 |
| MN 11705 | 0 | 0 | 6 | 0 | 94 | 0 | 0 | 10 | 90 |
| NE 9.75-1 | 10 | 2 | 2 | 2 | 84 | 0 | 0 | 6 | 94 |
| ND 651-9 | 2 | 4 | 2 | 2 | 90 | 0 | 0 | 12 | 88 |
| ND 860-2 | 0 | 0 | 0 | 0 | 100 | 0 | 4 | 2 | 94 |
| MEDIUM TO LATE | | | | | | | | | |
| La 12-59 | 0 | 0 | 2 | 0 | 98 | 0 | 0 | 2 | 98 |
| La 01-38 | 0 | 0 | 0 | 4 | 96 | 0 | 0 | 2 | 98 |
| MS700-83 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 10 | 90 |
| MS704-10 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 2 | 98 |
| MS716-15 | 4 | 0 | 0 | 0 | 96 | 0 | 0 | 10 | 90 |
| G670-11 | 8 | 4 | 0 | 6 | 82 | 14 | 0 | 2 | 84 |
| MN 11816 | 0 | 2 | 2 | 4 | 92 | 0 | 0 | 28 | 72 |
| MN 11903 | 2 | 0 | 0 | 2 | 96 | 0 | 2 | 8 | 90 |
| NE 106 | 90 | 0 | 2 | 0 | 8 | 8 | 0 | 10 | 82 |
| BN 9815-3 | 20 | 0 | 0 | 8 | 72 | 20 | 0 | 12 | 68 |
| ND671-4Russ | 2 | 0 | 2 | 8 | 88 | 4 | 2 | 6 | 88 |
| W 842 | 4 | 0 | 0 | 0 | 96 | 2 | 0 | 4 | 94 |
| W 903 | 0 | 0 | 0 | 2 | 98 | 0 | 0 | 2 | 98 |
| W 949R | 2 | 0 | 2 | 2 | 94 | 0 | 0 | 6 | 94 |
| Red Pontiac | 0 | 0 | 8 | 2 | 90 | 2 | 2 | 12 | 84 |
| Russet Burbank | 0 | 0 | 10 | 10 | 80 | 4 | 0 | 4 | 92 |
| Norgold Russet | 0 | 0 | 0 | 2 | 98 | 0 | 0 | 2 | 98 |
| Norchip | 0 | 2 | 8 | 2 | 88 | 0 | 2 | 24 | 74 |

(1) Based on four 25 tuber samples (one from each replication). Percentage based on number of tubers.

(2) Includes all tubers with scab lesions whether merely surface, pitted or otherwise and regardless of area.
Be sure to count tubers with any amount of scab in this category.

(3) This total - tubers free from any external defect of any sort.

(4) Percentage normal tubers are those showing no internal defects. Some individual tubers will have more than one type of internal defects.

Michigan Table 9. The Yield, Size Distribution and Specific Gravity of Several Potato Cultivars Grown in the Beltsville Trial.

| Variety | cwt/A | | Percent Size Distribution | | | | | S.G. |
|-------------------|-------|-------|---------------------------|-----|-------|------|-----------|-------|
| | Total | No. 1 | No. 1 | <2" | 2-3½" | >3½" | Pick Outs | |
| WF31-4 | 482 | 431 | 89 | 8 | 71 | 19 | 2 | 1.088 |
| Atlantic | 466 | 409 | 88 | 7 | 65 | 23 | 5 | 1.085 |
| WF46-4 | 451 | 406 | 90 | 8 | 70 | 20 | 2 | 1.084 |
| WF46-3 | 424 | 381 | 90 | 8 | 75 | 15 | 2 | 1.085 |
| B9140-32 | 385 | 324 | 84 | 14 | 82 | 2 | 2 | 1.083 |
| B6887-3(Y) | 430 | 324 | 75 | 23 | 59 | 16 | 2 | 1.064 |
| B9192-1 | 269 | 237 | 88 | 9 | 75 | 13 | 3 | 1.066 |
| B9540-29(Rus) | 334 | 207 | 62 | 36 | 56 | 6 | 2 | 1.075 |
| B9569-2(Rus) | 322 | 186 | 58 | 37 | 54 | 4 | 5 | 1.065 |
| B9553-6(Rus) | 290 | 184 | 64 | 30 | 53 | 10 | 7 | 1.066 |
| B9398-2(Rus) | 259 | 175 | 68 | 25 | 59 | 8 | 8 | 1.072 |
| B9540-53(Rus) | 225 | 113 | 50 | 49 | 49 | 1 | 1 | 1.072 |
| B9540-62(NemaRus) | 182 | 76 | 42 | 55 | 39 | 3 | 3 | 1.063 |
| B9540-55(Rus) | 160 | 62 | 38 | 58 | 37 | 2 | 3 | 1.062 |
| AVERAGE | 334 | 251 | 75 | | | | | 1.073 |

UNIVERSITY OF MINNESOTA
MINNESOTA POTATO BREEDING PROGRAM

Florian Lauer (Professor), Richard Wenkel, Dave Wildung, John Wiersma, Neil Andersen, Ernest Banttari, Duane Preston, Glen Litrud and Brian Smith

Two graduate students finished their research in potato breeding: Mahmoud Kasrawi, Ph.D. - March, 1985 and Abderrahmane Hilali, Ph.D. - October 1985. Dr. Kasrawi studied green peach aphid resistance inheritance and Dr. Hilali studied reciprocal differences in haploid tuberosum-phureja crosses in Morocco and Minnesota environments. Two other students have gathered all their data for their Ph.D. and are in various stages of writing their thesis. Brian Smith measured genetic progress in our S. andigena population and Mike Burke studied factors affecting crossing success in S. tuberosum x S. phureja combinations. Frank Treadwell joined us recently for an M.S. degree. He is studying how large a seedling population has to be so that the value of the cross can be estimated.

The emphasis in the breeding program has not changed significantly. We are still selecting primarily for yield, russets, chipping ability, high specific gravity, resistance to hollow heart and common scab.

In general, soil borne pathogens are becoming more important. Increasingly, compressed rotations enhance soil borne pathogens destructive to potatoes. The most significant in Minnesota are common scab, Verticillium wilt, and rhizoctonia. These can be addressed either with the breeding of resistant varieties or soil fungicants. Common scab is being effectively met via breeding. Four of the last five cultivars, Agassiz, Reddale, Tolaas and Krantz, released by the Minnesota Experiment Station, are highly resistant to common scab. With 'Reddale,' we may finally have a breakthrough for reducing Verticillium wilt. 'Reddale' has extremely low inoculation potential. Two of the most important cultivars in the U.S. (and Minnesota) are tolerant to Verticillium wilt but effectively inoculate soil through foliage residues. 'Reddale' is also tolerant but does not have high inoculation potential. The spores contained in 0.05 ml. of sap from stems of 'Kennebec,' 'Burbank,' and 'Reddale' are ca. 11,000, 6,700, and 156, respectively. (Neil Andersen-personal communication). It is probable that Verticillium wilt problems could be reduced significantly in cultivars such as Reddale (extremely low inoculation potential) were grown. Moreover, selecting for low inoculation potential may be an effective screening procedure in breeding for Verticillium wilt resistance. Rhizoctonia remains an enigma. Screening procedures are inaccurate and resistant sources have not been identified.

At the present time we start about 33,000 seedlings annually. In addition, we get 10,000-15,000 tubers from the Beltsville and Cornell breeding programs. We have about 25-30 acres of experimental plots annually. The primary plots are at Grand

Rapids - 10 acres (seedlines transplant, maintenance, basic increase and scab); Crookston - 10 acres (seedling evaluation); Grand Forks - 3 acres (evaluation of selections and seedlings) and Becker - 2 acres (evaluation of selections).

We are genetically "enhancing" two unadapted populations for further parent use. One of these is a tetraploid species, S. andigena, and the others are diploid species, S. phureja-S. stenotomum. Surprisingly good tuberization has been obtained in both populations even though we have begun imposing 90 day seasons on them. We have begun to integrate another diploid species, S. chacoense into the S. phureja-S. stenotomum population. Our experience with the S. phureja-S. stenotomum parents is that we get heavy yielding hybrids but we do have enough scab resistance. Hopefully, we can secure scab resistance from the S. chacoense population.

Of the 37 selections in advanced trials, i.e., replicated and preliminary replicated yield trials, nine have S. phureja in their ancestry and eight have S. andigena as one of the parents. I might add that 'Krantz,' released in 1985, has grandparents on one side that include 3/8 S. phureja, 1/4 S. spegazzinii, 1/4 S. rephanifolium, and 1/8 S. tuberosum.

Replicated Yield Trials: Yield trials of advanced selections and new named varieties were conducted in the RRV at Grand Forks and Baker (Preston), on nonirrigated sandy loam soil at Grand Rapids (Wildung), on irrigated sandy soil at Becker (Titrud), Big Lake (Ertel), and on peat soil at Anoka (Swanson). They were planted in 20 hill plots and replicated twice.

A total of 18 advanced selections and 18 new and standard cultivars were included. Table 1 gives the results at two locations in the RRV and Table 2 gives the results at Becker on the irrigated sands. MN10874 continued to perform satisfactorily. This is a russet with very good tuber type. Langlade, a new white cultivar from Wisconsin, was a heavy yielder in both the RRV and the irrigated sands.

Grower Increase of Advanced Selections: In cooperation with the Minnesota Department of Agriculture, three selections, MN 8742, MN10874, and MN11705 were released for increase to Foundation and Certified growers. MN8742, a red selection particularly adapted to the irrigated sands, was given an extensive field trial. It appears that the skin will not set even though it was harvested late in the season. MN8742 should, therefore, be discarded. A brief description of MN10874 and MN11705 follows:

MN10874 (russet):

Parentage: WC325-1 x Norgold Russet

Foliage: Large leafed, normal sized vine, medium maturity

Disease resistance: Intermediate scab resistance, some field resistance to early and late blight

Tuber characteristics: Blocky shaped tubers, good russetting, specific gravity is intermediate to high, good for boiling and baking, fair for frozen french fries

Yielding ability: Equals Norgold yield

MN10874 has performed satisfactorily on RRV, irrigated sand and peat soils.

MN11705 (white):

Parentage: Crystal x MN923.73-1

Foliage: Extra early maturity

Disease resistance: Intermediate scab resistance, some resistance to Verticillium wilt in tubers

Tuber characteristics: Blocky shaped tubers, intermediate specific gravity, excellent chipping quality

Yielding ability: Less than Norland and Norchip

MN11705 might have a place as an early maturing chipper.

Maintenance and increase of disease tested seedstocks: The advanced selections are being freed of pathogens via heat treatment and meristem procedures by Dr. Banttari and Dr. Anderson (Plant Pathology). Once free of pathogen, they are introduced into tissue culture (Horticulture). It appears that stocks can be maintained in tissue culture for relatively long periods of time. Thus we have stocks that have been maintained continuously for nine years. A possible grower maintenance and increase procedure for disease tested seedstocks by seed growers was demonstrated and reported in the 1984 October issue of the Valley Potato Grower.

Table 1. REPLICATED YIELD TRIALS - 1985

Grand Forks and Baker

| Variety | Color | Vigor ¹ | Maturity ² | Type ¹ | Total yield ³ | Market yield ^{3,4} | Specific gravity ⁵ | Shape ⁵ |
|----------|----------|--------------------|-----------------------|-------------------|--------------------------|-----------------------------|-------------------------------|--------------------|
| Reddale | Red | 2.0 | 4.0 | 2.5 | 49.1 | 45.8 | 1.082 | 2.0 |
| Kennebec | White | 1.5 | 4.8 | 3.3 | 43.9 | 41.6 | 1.087 | 2.5 |
| Langlade | White | 2.5 | 4.5 | 2.5 | 41.9 | 39.4 | 1.080 | 1.0 |
| Pontiac | Red | 1.5 | 4.3 | 2.8 | 40.5 | 38.8 | 1.082 | 2.0 |
| 12957 | Red | 2.3 | 3.5 | 2.5 | 41.0 | 38.2 | 1.084 | 2.0 |
| 8742 | Dark red | 2.3 | 3.8 | 3.0 | 42.3 | 37.5 | 1.086 | 2.0 |
| 12482 | White | 2.5 | 3.8 | 2.8 | 38.0 | 35.3 | 1.090 | 1.0 |
| Norchip | White | 1.8 | 2.8 | 2.8 | 37.9 | 35.2 | 1.097 | 1.0 |
| Erik | Red | 2.3 | 2.3 | 2.5 | 36.4 | 34.9 | 1.081 | 2.0 |
| 10874 | Russet | 2.3 | 4.3 | 2.3 | 37.2 | 34.2 | 1.095 | 2.0 |
| 12161 | White | 2.3 | 4.8 | 2.8 | 38.2 | 34.1 | 1.091 | 1.5 |
| 12567 | White | 2.3 | 3.3 | 2.8 | 36.0 | 33.7 | 1.089 | 2.5 |
| 12465 | White | 2.3 | 3.5 | 2.3 | 36.3 | 33.3 | 1.090 | 2.0 |
| 10162 | White | 2.3 | 4.3 | 3.0 | 36.9 | 32.0 | 1.102 | 3.0 |
| Shepody | White | 2.3 | 5.0 | 3.5 | 34.9 | 31.9 | 1.093 | 3.0 |
| Redcloud | Dark red | 3.0 | 4.3 | 2.5 | 34.3 | 31.7 | 1.083 | 2.0 |
| 12251 | White | 1.5 | 3.3 | 2.0 | 33.3 | 30.9 | 1.092 | 1.0 |
| Redsen | Dark red | 2.3 | 2.8 | 1.8 | 34.3 | 30.9 | 1.086 | 1.0 |
| 82328 | Lt. red | 2.0 | 3.5 | 2.5 | 34.7 | 30.8 | 1.090 | 2.0 |
| Krantz | Russet | 1.5 | 3.8 | 2.5 | 29.4 | 27.8 | 1.085 | 2.0 |
| Agassiz | Russet | 2.5 | 3.0 | 2.0 | 31.7 | 27.1 | 1.093 | 2.0 |
| Norland | Red | 2.3 | 1.3 | 1.8 | 28.4 | 27.1 | 1.082 | 1.0 |
| 11816 | Russet | 2.3 | 2.8 | 2.8 | 28.9 | 26.7 | 1.084 | 3.0 |
| Burbank | Russet | 1.8 | 5.5 | 4.0 | 36.2 | 26.6 | 1.090 | 3.0 |
| 11903 | Pink eye | 3.0 | 2.5 | 2.5 | 26.7 | 24.8 | 1.088 | 1.0 |
| 12171 | White | 2.3 | 2.8 | 3.0 | 27.2 | 23.9 | 1.103 | 2.0 |
| Norgold | Russet | 2.8 | 3.0 | 2.8 | 26.1 | 22.2 | 1.078 | 2.0 |
| 11705 | White | 2.8 | 1.3 | 2.3 | 25.3 | 21.4 | 1.085 | 2.0 |
| Sunrise | White | 2.0 | 3.0 | 2.5 | 22.3 | 19.7 | 1.086 | 1.0 |
| TC582-1 | Russet | 1.8 | 5.3 | 2.8 | 19.0 | 16.7 | 1.093 | 2.5 |
| 83040 | White | 2.0 | 3.3 | 2.8 | 28.5 | 16.5 | 1.086 | 1.0 |

Cooperators:

Duane Preston, Roger Hansen, Grand Forks
 Forrest Thompson, Duane Preston, Baker

¹ Scale, 1-5: 1, good; 5, poor² Scale, 1-6: 1, early; 6, late³ 20 hill plots⁴ LSD₀₅ = 7.2⁵ LSD₀₅ = .009⁶ GF data only. Scale, 1-3: 1, round; 2, blocky; 3, long

Table 2. LATE HARVEST REPLICATED YIELD TRIAL - 1985
Becker

| Variety | Color | Vigor ¹ | Early blight ² | Type ¹ | Total yield ³ | Market yield ^{3,4} | Specific gravity ⁵ | Shape ⁵ | Skinning ⁶ |
|-----------|-----------|--------------------|---------------------------|-------------------|--------------------------|-----------------------------|-------------------------------|--------------------|-----------------------|
| Pontiac | Red | 1.0 | 5.5 | 3.0 | 99.9 | 99.2 | 1.066 | 1.0 | 3.0 |
| 12567 | White | 1.0 | 3.5 | 1.0 | 94.6 | 93.2 | 1.076 | 2.0 | 3.0 |
| 8742 | Dark red | 1.0 | 7.5 | 1.5 | 86.2 | 85.5 | 1.069 | 2.0 | 2.0 |
| 83040 | White | 1.0 | 5.0 | 2.5 | 88.4 | 84.2 | 1.069 | 1.5 | 4.0 |
| Langlade | White | 2.0 | 3.5 | 2.0 | 85.3 | 83.6 | 1.069 | 1.0 | 3.5 |
| Kennebec | White | 1.0 | 4.5 | 3.0 | 84.1 | 82.7 | 1.073 | 2.0 | 4.0 |
| 12161 | White | 1.0 | 3.0 | 2.5 | 81.4 | 79.2 | 1.077 | 1.0 | 2.0 |
| Shepody | White | 2.0 | 3.5 | 3.0 | 75.5 | 74.7 | 1.073 | 3.0 | 1.0 |
| Reddale | Red | 2.0 | 4.5 | 2.5 | 75.0 | 74.4 | 1.070 | 2.0 | 4.0 |
| Krantz | Russet | 2.0 | 5.5 | 1.5 | 71.8 | 71.4 | 1.075 | 2.0 | 1.5 |
| 11816 | Russet | 1.5 | 6.0 | 3.0 | 71.4 | 70.5 | 1.077 | 3.0 | 2.0 |
| Erik | Red | 1.0 | 9.0 | 1.0 | 66.2 | 65.7 | 1.065 | 2.0 | 3.0 |
| 10162 | White | 2.0 | 5.5 | 2.5 | 68.1 | 65.5 | 1.082 | 2.0 | 2.5 |
| Conestoga | White | 1.0 | 8.0 | 2.5 | 65.9 | 64.1 | 1.070 | 1.0 | 0.5 |
| Burbank | Russet | 1.5 | 2.5 | 2.5 | 67.4 | 63.7 | 1.079 | 3.0 | 1.0 |
| Norchip | White | 1.5 | 7.5 | 3.0 | 64.5 | 63.6 | 1.075 | 1.0 | 2.0 |
| 82328 | Light red | 1.5 | 5.5 | 1.5 | 64.7 | 63.3 | 1.076 | 2.0 | 0.0 |
| 12251 | White | 1.5 | 6.0 | 2.5 | 63.7 | 62.5 | 1.073 | 1.0 | 0.0 |
| 12957 | Red | 1.5 | 7.5 | 1.0 | 63.4 | 62.0 | 1.066 | 2.0 | 2.0 |
| Tolaas | White | 2.0 | 7.0 | 1.0 | 62.1 | 60.8 | 1.068 | 2.5 | 0.5 |
| Norgold | Russet | 2.0 | 8.0 | 1.0 | 62.4 | 60.3 | 1.070 | 2.0 | 0.5 |
| 10874 | Russet | 1.5 | 6.0 | 1.5 | 60.5 | 59.4 | 1.074 | 2.0 | 2.0 |
| Norland | Red | 1.5 | 9.0 | 1.5 | 59.4 | 58.2 | 1.064 | 1.0 | 2.0 |
| 12482 | White | 1.5 | 8.0 | 2.0 | 59.2 | 57.5 | 1.065 | 1.0 | 0.5 |
| 11903 | Pink eye | 2.0 | 8.0 | 2.0 | 57.9 | 56.6 | 1.068 | 1.0 | 1.0 |
| 12465 | White | 2.0 | 8.0 | 2.0 | 57.3 | 55.4 | 1.064 | 1.0 | 2.5 |
| 12171 | White | 1.0 | 5.0 | 1.0 | 57.7 | 55.0 | 1.085 | 2.0 | 0.0 |
| Sunrise | White | 2.0 | 7.0 | 2.5 | 52.9 | 52.4 | 1.077 | 1.0 | 0.0 |
| Redcloud | Dark red | 3.0 | 5.5 | 3.5 | 54.8 | 52.3 | 1.073 | 2.0 | 2.0 |
| 12438 | White | 2.0 | 7.5 | 2.0 | 53.4 | 52.2 | 1.065 | 1.0 | 1.5 |
| 11705 | White | 1.5 | 9.0 | 2.5 | 54.9 | 51.7 | 1.071 | 2.0 | 0.0 |
| WNC567-1 | Russet | 1.5 | 5.5 | 1.5 | 52.6 | 50.5 | 1.065 | 2.5 | 0.0 |
| Redsen | Dark red | 2.0 | 9.0 | 1.5 | 50.9 | 47.9 | 1.067 | 1.0 | 2.0 |
| TC582-1 | Russet | 2.0 | 3.5 | 2.0 | 47.4 | 46.0 | 1.091 | 2.0 | 1.5 |
| 12329 | Russet | 3.0 | 7.5 | 2.0 | 46.1 | 45.0 | 1.068 | 2.0 | 1.0 |
| Agassiz | Russet | 2.0 | 8.0 | 1.0 | 49.1 | 44.7 | 1.068 | 2.0 | 0.0 |

- 1 Scale, 1-5: 1, good; 5, poor
- 2 Scale, 0-11 (Barratt-Horsfall):
0, resistant; 11, susceptible
- 3 20 hill plots, 12" between hills,
36" between rows
- 4 LSD₀₅ = 16.3
- 5 Scale, 1-3: 1, round; 2, blocky;
3, long
- 6 Scale, 1-4: 0, good; 4, bad
Cooperator: Glen Titrud
Planted: April 18, 1985
Killed: August 8, 1985
Harvested: August 14, 1985

Fertilization: 215 lbs/A 0-0-22
(Broadcast)
Starter: 1150 lbs/A 8-10-30 (Banded)
Sidedress: May 14, 250 lbs/A 33-0-0
May 29, 160 lbs/A 33-0-0
July 15, 218 lbs/A 33-0-0

NEW YORK - LONG ISLAND

J.B. Sieczka, D. D. Moyer and R.C. Neese

| | |
|---------------------|--|
| General Information | Six replicated variety evaluations, six fertilizer experiments, a spacing study and a seedling observational trial were conducted on Long Island in 1985. |
| Early White | Jemseg produced the best marketable yield, but was plagued with hollow heart. Jemseg and C7679-15 produced larger tubers than the other lines. Tubers of C7679-15 had the highest specific gravity. |
| Main Season White | The GN resistant clones NY72, NY77, NY78 and NY80 and the GN susceptible AF303-5 produced significantly higher yield of marketable tubers than Katahdin. However internal defects were unacceptably high in AF303-5. Internal defects were also a problem in Hampton, Hudson, Langlade, B9581-10, CF7688-9 and F74123. Shepody, CF7688-9, NY72 and NY75 produced tubers with specific gravity readings greater than 1.080. |
| Russet | Acadia Russet produced the highest yield. Generally, the skin netting on Acadia tubers is very slight and would not be classified as a russet. The same applies to WF591-1. The latter clone has an unacceptable appearance for the tablestock market. The most attractive russet was B9596-2. |
| South Fork | Only NY72 produced a marketable yield that was significantly higher than Katahdin. Hampton, Hudson, C7523-1, NY76, NY79 and NY80 produced yields that were not significantly different from Katahdin. Internal defects showed up as problems in Hudson, Superior, NY64 and NY79. The best appearing lines were Hampton, NemaRus, C7523-1 and NY80. |
| Nitrogen Rate | The clones B9192-1 and B9569-2 did not respond to nitrogen rates higher than 160 lb/A. C7523-1 produced the highest marketable yield at 190 lb N/A. Total and marketable yields of NemaRus and NY72 increased with increasing nitrogen rates. None of the nitrogen treatments had an effect on defects or specific gravity. |
| Hampton Spacing | Within row spacings of 6, 9 and 12 inches did not affect the total or marketable yields of Hampton. The 12 inch spacing produced the fewest number of tubers per foot of row, the largest average size, and the most internal defects. External defects, specific gravity and appearance were not affected by spacing. |
| Acknowledgements | Seed was provided by Robert L. Plaisted, Cornell University; Raymon E. Webb, USDA; and Hugh J. Murphy, University of Maine. Special thanks are extended to the Corwith Bros. for providing the land and assistance in the establishment and care of the experiment on the South Fork. Thanks are also extended to John Babinsky for use of harvesting equipment. |

Long Island Table 1. Results of Early White Potato Variety Trial, Riverhead, NY, 1985
Standard Variety : Superior

| Clone ¹ | Yield (cwt/A) | | % of Std | % of Total Yield | | | | | Internal Defects ³ | | | | | Spec. ⁴ | Vine ⁵ |
|--------------------|---------------|------|----------|------------------|-------|-------|-----|------------------|-------------------------------|----|---|---|---|--------------------|-------------------|
| | Total US No.1 | | | 2"- | 2.5- | 3.25- | >4" | Def ² | Int. Nec. | | | | | Grav. | Mat. |
| | 2-4 | 2-4" | | 2.5" | 3.25" | 4" | | HH | BC | SL | M | S | | | |
| <hr/> | | | | | | | | | | | | | | | |
| Superior | 389 | 299 | 100 | 44 | 33 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 75 | 1.8 |
| Chippewa | 409 | 286 | 96 | 31 | 37 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 69 | 3.8 |
| Jemseg | 424 | 365 | 122 | 18 | 56 | 11 | 0 | 5 | 14 | 1 | 0 | 0 | 0 | 63 | 2.8 |
| Sunrise | 398 | 324 | 108 | 31 | 47 | 3 | 1 | 2 | 2 | 1 | 1 | 0 | 0 | 73 | 1.8 |
| <hr/> | | | | | | | | | | | | | | | |
| CF7679-15 | 360 | 325 | 109 | 19 | 59 | 12 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 82 | 5.3 |
| CS7639-1 | 419 | 338 | 113 | 27 | 51 | 3 | 0 | 4 | 2 | 0 | 6 | 0 | 0 | 70 | 3.3 |
| NY-79 | 390 | 355 | 119 | 26 | 62 | 3 | 0 | 2 | 6 | 0 | 1 | 0 | 0 | 66 | 3.0 |
| Waller- | | | | | | | | | | | | | | | |
| Duncan | (0.05) | (ns) | (ns) | | | | | | | | | | | (04) | |

| Tuber Data ⁶ | | | | | | |
|-------------------------|-----|-------|------|-------|-------|-----------------------|
| Clone | App | Color | Text | Shape | Depth | Comments ⁷ |
| Superior | 7.0 | Bu | SN | R | MT | Irr |
| Chippewa | 7.3 | W | S | O | F | OK |
| Jemseg | 6.8 | Bu | N | O | F | Irr |
| Sunrise | 7.5 | W | RS | O-R | SF | Nice |
| CF7679-15 | 7.3 | W | RS | R | MT | Sl Irr |
| CS7639-1 | 7.0 | Bu | SN | R | MT | Sl Irr |
| NY79 | 7.0 | Bu | SN | R | R | DSE, Sl Irr |

- 1/ Planted 4/15/85, rotobeat 8/13/85, harvested 8/14/85. Within row spacing 9.3". Fertilizer applied at a rate of 1140 lb/A of 7-18-14-4 (MgO) in bands at time of planting, 80 lbs of N sidedressed. Plot size 2 rows x 12 feet, 4 replications.
- 2/ Defects = Total of all defects. Abbreviations for major defects listed in comments. S = sunburn, M = misshapen, G = growth cracks, L = prominent lenticels, Sc = scab, Rh = Rhizoctonia russetting.
- 3/ Number of tubers with hollow heart (including brown center) or internal necrosis of 40 tubers cut (10 per replication), Sl = slight, M = moderate, S = severe.
- 4/ Specific gravity determined by hydrometer, 1.0 omitted.
- 5/ Vine maturity rated on 8/9/85 on a scale of 1 to 9, 1 = completely dead, 9 = green and vigorous.
- 6/ Color - B = brown, BR = bright red, Bu = buff, BW = bright white, MR = Medium red, P = pink, Pu = purple, W = white, T = tan.
Texture - HR = heavy russet, RS = relatively smooth, SN = slight net, S = smooth.
Shape - O = oblong, L = long, R = round.
Depth - F = flat, MT = medium thick, R = round, SF = slightly flattened.
Appearance - rated on a scale of 1 to 9; 1 = extremely rough, unattractive, 9 = smooth, attractive.
- 7/ Comment abbreviations. Att = attractive, CT = chain tubers, DAE = deep apical eyes, DSE = deep stem end, HS = heat sprouts, Irr = irregular, Kn = knobs, MDAE = moderately deep apical eyes, P = pink, SE = shallow eyes, Sk = skinned, Sl = slightly, Sm = small, St = stolons, Y = yellow

Long Island Table 2. Results of NE107 Main Season Variety Experiment, Riverhead, N.Y. 1985
Standard Variety : Katahdin

| Clone ¹ | Yield (cwt/A) | | % of Std | % of Total Yield | | | | | Int. Def. ³ | | | | | Spec. ⁴ | Vine ⁵ |
|--------------------|---------------|---------|----------|------------------|-------|-------|-----|------------------|------------------------|----|----|----|---|--------------------|-------------------|
| | Total | US No.1 | | 2"- | 2.5- | 3.25- | >4" | Def ² | Int. Nec. | | | | | Grav. | Mat. |
| | 2-4 | 2-4 | | 2.5" | 3.25" | 4" | | | HH | BC | SL | M | S | | |
| Katahdin | 438 | 365 | 100 | 22 | 58 | 3 | 0 | 3 | 1 | 0 | 1 | 0 | 0 | 68 | 1.8 |
| Hampton | 350 | 309 | 85 | 19 | 62 | 8 | 1 | 3 | 2 | 0 | 3 | 2 | 2 | 65 | 1.8 |
| Hudson | 322 | 274 | 75 | 23 | 57 | 5 | 0 | 2 | 0 | 3 | 3 | 0 | 0 | 72 | 1.5 |
| Langlade | 461 | 373 | 101 | 24 | 57 | 0 | 0 | 2 | 2 | 4 | 1 | 0 | 0 | 66 | 2.0 |
| Shepody | 491 | 395 | 108 | 34 | 45 | 2 | 0 | 6 | 1 | 0 | 0 | 0 | 0 | 85 | 2.5 |
| AF303-5 | 527 | 475 | 130 | 16 | 69 | 5 | 0 | 1 | 3 | 1 | 12 | 11 | 4 | 76 | 5.5 |
| AF474-2 | 365 | 299 | 82 | 28 | 53 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 68 | 1.3 |
| CF7523-1 | 450 | 365 | 100 | 32 | 50 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 70 | 2.0 |
| CF7688-9 | 406 | 277 | 76 | 35 | 32 | 2 | 0 | 1 | 0 | 3 | 3 | 1 | 0 | 83 | 1.0 |
| F74123 | 495 | 405 | 111 | 24 | 57 | 2 | 0 | 3 | 1 | 0 | 3 | 2 | 0 | 67 | 2.0 |
| NY-64 | 461 | 328 | 90 | 33 | 38 | 0 | 0 | 6 | 1 | 0 | 3 | 0 | 0 | 71 | 1.0 |
| NY-72 | 493 | 425 | 116 | 20 | 60 | 6 | 0 | 3 | 1 | 0 | 3 | 0 | 0 | 81 | 2.0 |
| Waller- | | | | | | | | | | | | | | | |
| Duncan (0.05) | (70) | (61) | | | | | | | | | | | | (04) | |

Tuber Data⁶

| Clone | App | Color | Text | Shape | Depth | Comments ⁷ |
|----------|-----|-------|------|-------|-------|-----------------------|
| Katahdin | 7.0 | W | RS | R | SF | Sl Irr,L |
| Hampton | 7.0 | W | S | R | R | L |
| Hudson | 6.8 | W | RS | R-O | SF | Irr |
| Langlade | 7.0 | W | RS | R-O | SF | Sl Irr,SE |
| Shepody | 6.8 | Bu | SN | O-L | SF | Sl Irr |
| AF303-5 | 6.7 | Bu | SN | O-R | MT | Irr |
| AF474-2 | 8.0 | W | RS | O-R | R | SF |
| CF7523-1 | 7.0 | W | RS | R | R | Sl Irr |
| CF7688-9 | 6.0 | Bu | SN | R-O | SF | Irr,Ugly |
| F74123 | 7.0 | W | S | O | SF | Y,Sp,Irr |
| NY-64 | 7.0 | W | S | O | F | DAE,Irr,Pear |
| NY-72 | 7.3 | Bu | SN | R-O | MT | Dark Skin |

1/ Vine killed 9/3/85, harvested 9/25/85, see footnote 1, Table 1.

2/ -1/ See appropriate footnotes Table 1.

5/ Rated 8/29/85.

Long Island Table 3. Results of Advanced Golden Nematode Resistant Clones Experiment, Riverhead, N.Y. 1985

Standard Variety :Katahdin

| Clone ¹ | Yield (cwt/A) | | % of Std 2-4" | % of Total Yield | | | | | Internal Defects ³ | | | | | Spec. ⁴ Grav. | Vine ⁵ Mat. |
|--------------------|---------------|----------------|---------------------|------------------|-------|-------|-----|------------------|-------------------------------|----|---|---|---|-----------------------------|---------------------------|
| | Total | US No.1 2-4 | | 2"- | 2.5- | 3.25- | >4" | Def ² | Int. Nec. | | | | | | |
| | | | | 2.5" | 3.25" | 4" | HH | | BC | SL | M | S | | | |
| Katahdin | 369 | 300 | 100 | 25 | 53 | 4 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 72 | 1.8 |
| Hampton | 309 | 256 | 85 | 14 | 53 | 16 | 4 | 6 | 0 | 0 | 2 | 0 | 0 | 65 | 1.0 |
| Hudson | 362 | 321 | 107 | 12 | 60 | 16 | 2 | 3 | 0 | 1 | 2 | 2 | 0 | 74 | 1.5 |
| B8710-1 | 375 | 265 | 88 | 43 | 27 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 71 | 1.0 |
| B9192-1 | 339 | 300 | 100 | 14 | 66 | 8 | 0 | 5 | 0 | 0 | 2 | 0 | 0 | 73 | 1.0 |
| B9581-10 | 376 | 317 | 106 | 24 | 55 | 5 | 0 | 7 | 8 | 0 | 0 | 0 | 0 | 73 | 1.3 |
| B9792-53 | 405 | 297 | 99 | 35 | 38 | 0 | 1 | 1 | 1 | 0 | 3 | 0 | 1 | 93 | 1.3 |
| NY-72 | 453 | 413 | 137 | 19 | 65 | 7 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 83 | 1.0 |
| NY-75 | 324 | 256 | 85 | 30 | 48 | 1 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 82 | 1.0 |
| NY-76 | 385 | 272 | 91 | 40 | 31 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 73 | 1.0 |
| NY-77 | 470 | 411 | 137 | 28 | 58 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 74 | 1.0 |
| NY-78 | 474 | 383 | 128 | 26 | 54 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 68 | 2.0 |
| NY-80 | 435 | 360 | 120 | 31 | 50 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 65 | 1.0 |
| Waller- Duncan | (0.05) | (42) | (44) | | | | | | | | | | | (04) | |

| Tuber Data ⁶ | | | | | | |
|-------------------------|-----|-------|------|-------|-------|-----------------------|
| Clone | App | Color | Text | Shape | Depth | Comments ⁷ |
| Katahdin | 7.3 | W | RS | R | SF | SE, Sl Irr |
| Hampton | 7.0 | W | S | R | R | SE, L |
| Hudson | 6.5 | W | RS | R-O | SF | Sl Irr |
| B8710-1 | 6.3 | W | S | O | F | Irr, Pear |
| B9192-1 | 6.5 | Bu | SN | R | R | MDE, Irr |
| B9581-10 | 6.5 | Bu | SN | R | MT | Irr |
| B9792-53 | 6.5 | W | RS | O-R | SF | Irr, Pear |
| NY-72 | 8.0 | Bu | SN | R | R | MDAE |
| NY-75 | 7.0 | Bu | SN | R | SF | Sm, SE |
| NY-76 | 7.0 | W | RS | R | R | Sm, SE |
| NY-77 | 7.0 | Bu | SN | R | R | MDAE, Sl Y |
| NY-78 | 7.0 | Bu | SN | R | SF | MDAE, Sl Irr |
| NY-80 | 8.0 | W | RS | R | MT | P buds |

1/ Vine killed 9/3/85, harvested 9/25/85. Plot size 1 row x 20'. See footnote 1, Table 1.

2/-1/ See appropriate footnotes, Table 1.

5/ Rated 8/29/85.

Long Island Table 4. Results of NE107 Russett Experiment, Riverhead, N.Y. 1985
Standard Variety : BelRus

| Clone ¹ | <u>Yield (cwt/A)</u> | | % of Std | <u>% of Total Yield</u> | | | | | <u>Internal Defects³</u> | | | | | Spec. ⁴ Grav. | Vine ⁵ Mat. |
|--------------------|----------------------|------|-------------|-------------------------|------|-------|-----|------------------|-------------------------------------|----|----|---|---|-----------------------------|---------------------------|
| | Total US No.1 | | | 4-8 | 8-12 | 12-16 | >16 | Def ² | <u>Int. Nec.</u> | | | | | | |
| | 4-16 | 4-16 | | | | | | | HH | BC | SL | M | S | | |
| BelRus | 299 | 197 | 100 | 48 | 15 | 3 | 5 | 2 | 2 | 0 | 1 | 0 | 0 | 75 | 1.3 |
| Acadia Russet | 478 | 352 | 179 | 28 | 35 | 10 | 9 | 2 | 0 | 0 | 3 | 1 | 0 | 74 | 3.8 |
| NemaRus | 369 | 266 | 135 | 46 | 23 | 3 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 71 | 1.0 |
| Russette | 381 | 274 | 140 | 44 | 21 | 7 | 2 | 5 | 3 | 0 | 0 | 0 | 0 | 79 | 3.8 |
| B9569-2 | 328 | 224 | 114 | 38 | 22 | 8 | 0 | 9 | 2 | 0 | 1 | 0 | 0 | 70 | 1.8 |
| B9596-2 | 413 | 295 | 150 | 41 | 22 | 8 | 1 | 2 | 2 | 0 | 1 | 2 | 0 | 69 | 1.8 |
| WF591-1 | 376 | 268 | 136 | 41 | 25 | 6 | 2 | 3 | 0 | 0 | 1 | 0 | 0 | 75 | 1.5 |
| Waller- Duncan | (0.05) | (51) | (44) | | | | | | | | | | | (04) | |

Tuber Data⁶

| Clone | App | Color | Text | Shape | Depth | Comments ⁷ |
|------------|-----|-------|------|-------|-------|-----------------------|
| BelRus | 7.3 | B | HR | L | SF | SE, Dark |
| Acadia Rus | 7.0 | Bu | SN | O | SF | Sl Irr |
| NemaRus | 7.5 | B | MR | L | R | SE |
| Russette | 7.0 | B | MR | O | SF | Sl Irr |
| B9569-2 | 7.0 | B | M-HR | O-L | MT | Irr |
| B9596-2 | 7.8 | B | MR | L | R | SE, Att |
| WF591-1 | 5.5 | Bu | SN | R-O | F | Irr, DE |

1/ Vine killed 9/3/85, harvested 9/25/85, see footnote 1, Table 1.

2/ - 1/ See appropriate footnotes Table 1.

5/ Rated 8/29/85.

Long Island Table 5. Results of USDA Russet Experiment, Riverhead, N.Y. 1985
Standard Variety : BelRus

| Clone ¹ | <u>Yield (cwt/A)</u> | | % of Std | <u>% of Total Yield</u> | | | | | <u>Internal Defects³</u> | | | | | <u>Spec.⁴ Vine⁵</u> | |
|--------------------|----------------------|---------|-------------|-------------------------|------|-------|-----|------------------|-------------------------------------|----|----|---|---|---|------|
| | Total | US No.1 | | 4-8 | 8-12 | 12-16 | >16 | Def ² | <u>Int. Nec.</u> | | | | | Grav. | Mat. |
| | 4-16 | 4-16 | | | | | | | HH | BC | SL | M | S | | |
| BelRus | 248 | 170 | 100 | 43 | 22 | 3 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 76 | 1.0 |
| NemaRus | 360 | 269 | 158 | 33 | 31 | 11 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 71 | 1.3 |
| B9553-6 | 396 | 236 | 139 | 32 | 21 | 7 | 7 | 16 | 1 | 0 | 0 | 0 | 0 | 68 | 1.0 |
| B9569-2 | 364 | 207 | 121 | 41 | 13 | 3 | 1 | 3 | 0 | 0 | 2 | 0 | 0 | 73 | 1.0 |
| B9596-2 | 392 | 290 | 170 | 48 | 22 | 4 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 70 | 1.0 |
| B9752-7 | 487 | 331 | 195 | 34 | 27 | 7 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 69 | 2.0 |
| Waller- Duncan | (0.05) | (53) | (46) | | | | | | | | | | | (02) | |

| <u>Tuber Data⁶</u> | | | | | | |
|-------------------------------|-----|-------|------|-------|-------|-----------------------|
| Clone | App | Color | Text | Shape | Depth | Comments ⁷ |
| BelRus | 7.5 | B | HR | L | SF | Dark, SE |
| NemaRus | 7.5 | B | H-MR | L | SF | Rh |
| B9553-6 | 6.8 | B | MR | L-O | SF | Irr, G, Rh |
| B9569-2 | 6.8 | B | M-HR | O-L | SF | Sl Irr, Rh |
| B9596-2 | 8.3 | B | M-HR | L | R | SE, Att |
| B9752-7 | 7.0 | B | MR | O-L | MT | Sl Irr |

1/ Vine killed 9/3/85, harvested 9/25/85. Plot size 1 row x 20'. See footnote 1, Table 1.

2/ - 7/ See appropriate footnotes, Table 1.

5/ Rated 8/29/85.

Long Island Table 6. Results of South Fork Main Season Variety Experiment, Water Mill, N.Y. 1985
Standard Variety : Katahdin

| Clone ¹ | Yield (cwt/A) | | % of | | % of Total Yield | | Int. Def. ³ | | | | | Vine ⁴ | | Tuber Data ⁵ | | | |
|--------------------|---------------|---------|------|-----|------------------|------------------|------------------------|----|----|---|---|-------------------|------|-------------------------|------|-------|------|
| | Total | US No.1 | Std | 2"- | >4 | Def ² | Int. Nec. | | | | | Mat. | App. | Col. | Text | Shape | Dep. |
| | 2-4 | 2-4" | 4" | | | | HH | BC | SL | M | S | | | | | | |
| Katahdin | 302 | 286 | 100 | 85 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | W | S | R | MT |
| Hampton | 269 | 255 | 89 | 79 | 0 | 16 | 0 | 0 | 5 | 0 | 0 | 5 | 8 | W | S | R | R |
| Hudson | 336 | 317 | 111 | 80 | 1 | 13 | 0 | 3 | 12 | 0 | 0 | 7 | 7 | W | RS | R | MT |
| NemaRus | 242 | 193 | 68 | 75 | 0 | 5 | 2 | 0 | 0 | 0 | 0 | 4 | 8 | B | HR | L | MT |
| Sunrise | 238 | 215 | 75 | 79 | 0 | 11 | 0 | 2 | 1 | 0 | 0 | 2 | 7 | BU | SN | O-R | MT |
| Superior | 275 | 240 | 84 | 81 | 0 | 6 | 0 | 3 | 6 | 0 | 0 | 1 | 7 | W | N | R-O | MT |
| B9192-1 | 217 | 199 | 69 | 70 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 2 | 7 | W | RS | R-O | R |
| B9569-2 | 209 | 144 | 50 | 59 | 0 | 10 | 1 | 0 | 3 | 0 | 0 | 3 | 7 | B | HR | O-L | MT |
| C7523-1 | 328 | 289 | 101 | 83 | 1 | 5 | 0 | 0 | 1 | 0 | 0 | 5 | 8 | W | S | R | R |
| NY-64 | 257 | 236 | 83 | 70 | 0 | 22 | 0 | 0 | 9 | 0 | 0 | 2 | 7 | W | S | O | F |
| NY-72 | 381 | 359 | 126 | 41 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | BU | SN | R | MT |
| NY-75 | 243 | 218 | 76 | 83 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 7 | W | RS | R-O | SF |
| NY-76 | 303 | 270 | 95 | 88 | 0 | 1 | 0 | 0 | 3 | 1 | 0 | 4 | 7 | BU | SN | O-R | SF |
| NY-77 | 235 | 203 | 71 | 82 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 3 | 7 | W | RS | R-O | MT |
| NY-79 | 278 | 260 | 91 | 83 | 1 | 10 | 4 | 1 | 4 | 0 | 0 | 1 | 7 | BU | N | R | R |
| NY-80 | 303 | 263 | 92 | 84 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 8 | W | S | R-O | MT |

Waller-Duncan
(0.05) (41) (34)

1/ Planted 4/12/85, vine killed 8/22/85, harvested 10/9/85. Fertilizer applied at a rate of 1750 lb/A of 10-20-10 in bands at time of planting. Plot size was 2 rows x 12', 3 replications. The russet lines, NemaRus and B9569-2, were sized on a basis of weight. The 2-4" size translates into 4-16 oz for these clones.

2/ - 5/ See appropriate footnotes, Table 1.

3/ Thirty tubers were cut.

4/ Rated 8/12/85.

Long Island Table 7. The effect of nitrogen rate on yield and quality of B9192-1, C7523-1 and NY-72, Riverhead, N.Y.1985.

Standard Practice : 160 lb N/A

| Clone ¹ | N Rate (lb/A) | Yield (cwt/A) | | % of Std 2-4" | % of Total Yield | | | | | Int. Def. ³ | | | | | Spec. ⁴ Vine ⁵ | |
|---------------------|------------------|---------------|---------|---------------------|------------------|-------|-------|-----|------------------|------------------------|----|----|---|---|--------------------------------------|------|
| | | Total | US No.1 | | 2"- | 2.5- | 3.25- | >4" | Def ² | Int. Nec. | | | | | Grav. | Mat. |
| | | | 2-4" | | 2.5" | 3.25" | 4" | | | HH | BC | SL | M | S | | |
| B9192-1 | 160 | 371 | 333 | 100 | 16 | 67 | 6 | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 75 | 1.3 |
| | 190 | 406 | 361 | 109 | 16 | 66 | 7 | 1 | 4 | 0 | 0 | 1 | 0 | 0 | 74 | 1.3 |
| | 220 | 423 | 367 | 110 | 14 | 65 | 8 | 1 | 7 | 0 | 0 | 0 | 1 | 0 | 73 | 2.0 |
| Waller-Duncan (.05) | | (ns) | (ns) | | | | | | | | | | | | (ns) | |
| C7523-1 | 160 | 419 | 347 | 100 | 32 | 51 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 75 | 1.3 |
| | 190 | 463 | 397 | 114 | 32 | 53 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 74 | 2.5 |
| | 220 | 459 | 380 | 109 | 35 | 47 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 74 | 2.3 |
| Waller-Duncan (.05) | | (ns) | (47) | | | | | | | | | | | | (ns) | |
| NY-72 | 160 | 434 | 374 | 100 | 33 | 52 | 1 | 0 | 2 | 0 | 3 | 1 | 0 | 0 | 83 | 2.0 |
| | 190 | 477 | 426 | 114 | 31 | 56 | 3 | 0 | 1 | 0 | 4 | 0 | 0 | 0 | 80 | 3.0 |
| | 220 | 509 | 451 | 120 | 25 | 58 | 5 | 0 | 2 | 0 | 8 | 0 | 0 | 0 | 84 | 3.3 |
| Waller-Duncan (.05) | | (52) | (70) | | | | | | | | | | | | (ns) | |

1/ NY-72 planted 4/19/85, harvested 10/11/85, B9192-1 and C7523-1 planted 4/24/85, harvested 10/2/85. Plot size 3 rows x 30', center row x 25' used for yield data. Experimental design was a randomized complete block with 4 replications. Nitrogen rates consisted of split applications. Eighty pounds of nitrogen from ammonium nitrate was sidedressed on 6/4/85, the remaining amount of nitrogen listed was applied at planting.

2/ - 5/ See appropriate footnotes, Table 1.

5/ Rated 8/29/85.

Long Island Table 8. The effect of nitrogen rate on yield and quality of two golden nematode resistant russet clones (NemaRus and B9569-2)

| Clone ¹ | N Rate (lb/A) | Yield (cwt/A) | | % of Std 4-16" | % of Total Yield | | | | | Int. Def. ³ | | | | | Spec. ⁴ Vine ⁵ | |
|--------------------|------------------|---------------|---------|----------------------|------------------|------|-------|-----|------------------|------------------------|----|----|---|---|--------------------------------------|------|
| | | Total | US No.1 | | 4-8 | 8-12 | 12-16 | >16 | Def ² | Int. Nec. | | | | | Grav. | Mat. |
| | | | | | | | | | | HH | BC | SL | M | S | | |

| | | | | | | | | | | | | | | | | |
|---------|-----|-----|-----|-----|----|----|---|---|---|---|---|---|---|---|----|-----|
| NemaRus | 160 | 332 | 237 | 100 | 46 | 21 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 72 | 1.0 |
| | 190 | 374 | 274 | 116 | 49 | 22 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 72 | 2.5 |
| | 220 | 390 | 289 | 122 | 47 | 24 | 4 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 72 | 1.8 |

Waller-
Duncan (0.05) (38) (42) (ns)

| | | | | | | | | | | | | | | | | |
|--------|-----|-----|-----|-----|----|----|---|---|---|---|---|---|---|---|----|-----|
| 9569-2 | 160 | 339 | 246 | 100 | 49 | 18 | 5 | 2 | 4 | 0 | 0 | 1 | 1 | 0 | 74 | 1.8 |
| | 190 | 362 | 263 | 107 | 47 | 19 | 7 | 5 | 3 | 0 | 0 | 1 | 0 | 0 | 75 | 2.5 |
| | 220 | 343 | 244 | 99 | 46 | 19 | 6 | 1 | 4 | 2 | 0 | 1 | 0 | 0 | 73 | 2.3 |

Waller-
Duncan (0.05) (ns) (ns) (ns)

1/ Planted 4/24/85, see footnote 1/ Table 7.

2/ - 5/ See appropriate footnotes, Table 1.

5/ Rated 8/29/85.

Long Island Table 9. The effect of spacing on yield and quality of Hampton, 1985.

| Spacing (in) | Tuber No/ft | Mean Tuber Wt (oz) | Total Yield (cwt/A) | | | | | | | Spec ² Grav | App. ³ | Internal Defects ^{4/} | | | | |
|-----------------|----------------|--------------------------|---------------------|------|----|-------------|----------------|--------------|------------------|---------------------------|-------------------|--------------------------------|----|----|---|---|
| | | | Total | 2-4" | <2 | 2"- 2.5" | 2.5"- 3.25" | 3.25"- 4" | >4 | | | Int. Nec. | | | | |
| | | | | | | | | | Def ² | | | HH | BC | SL | M | S |

| | | | | | | | | | | | | | | | | | |
|----|------|-----|-----|-----|----|----|-----|----|---|----|----|-----|---|---|---|---|---|
| 6 | 17.2 | 4.5 | 375 | 288 | 69 | 98 | 181 | 9 | 0 | 18 | 65 | 7.6 | 1 | 0 | 5 | 1 | 0 |
| 9 | 15.2 | 5.0 | 363 | 283 | 57 | 79 | 186 | 18 | 0 | 23 | 65 | 7.6 | 3 | 2 | 2 | 0 | 0 |
| 12 | 12.6 | 5.8 | 349 | 287 | 35 | 63 | 186 | 38 | 7 | 19 | 65 | 7.4 | 1 | 1 | 7 | 4 | 0 |

Waller-
Duncan (.05) (2.1) (0.3) (ns) (ns) (10) (5) (ns) (10) (ns) (ns) (ns)

1/ Planted 4/24/85, vine killed 9/3/85, harvested 10/2/85. Plot size 4 rows X 23', 2 center rows X 20' used for yield data, 5 replications. See footnote 1, Table 1.

2/ - 4/ See appropriate footnotes, Table 1.

4/ Fifty tubers cut per treatment.

NEW YORK - UPSTATE

D. E. Halseth, W. L. Hymes and C. A. Maatta

- Program Scope** The Vegetable Crops Department conducted nine replicated variety yield trials distributed across five counties in upstate New York in 1985 in which a total of 18 named varieties and 66 advanced numbered clones were evaluated. Additional information on russet variety x nitrogen fertilization x plant spacing, storage and chipping research can be obtained from the authors.
- Research Farm Trials** All 84 entries mentioned above, along with 17 observational clones from the USDA (R. E. Webb), were evaluated at the Thompson Vegetable Research Farm at Freeville. These experiments were planted at 9" spacing on a 34" bed with 1200 lbs/A of 13-13-13 applied in bands at planting on a Howard gravelly loam. All experiment station trials were sprinkler irrigated. See footnotes of tables 1-5 for dates of planting, vinekill and harvest.
- Commercial Grower Trials** Four replicated variety yield trials consisting of 12 to 24 lines were planted with commercial potato growers in four different counties. Two of these trials were for evaluating tablestock clones (Tables 6 and 7) grown on muck (peat) soils and two were for chipping performance (Tables 8 and 9) on mineral soils. None of the grower trials were irrigated. See footnotes on each table for dates of cultural practices.
- Seasonal Observations** Problems encountered in 1985 were primarily associated with drier than normal growing conditions in July and August resulting in reduced yields on the mineral soils in the Steuben and Wyoming County trials, while the muck trials were not as adversely affected. Bruising damage was again a significant problem, especially for varieties with high specific gravities. Hollow heart and internal discoloration generally were not a problem except in the late season trial (Table 3) at Freeville. Early blight and scab were observed on some susceptible lines but neither were as bad as in 1984. Chip color was excellent for many lines when chipped in January of 1986 (data not presented).
- Promising Clones** Round white golden nematode (GN) resistant numbered clones which have consistently performed well are B8710-1, NY71, NY72 and NY81. Named white varieties with GN resistance which continue to yield competitively are Atlantic, Elba and Hampton. NemaRus, the only named GN resistant russet variety, produced good yields of long tubers of medium russet skin texture. Acadia, ND388-1 (NorKing Russet) and ND534-4 produced very good yields of attractive russet tubers on muck and mineral soils. Unfortunately, all three of these clones are GN susceptible.

Table Headings
Explanation

Sizes used in tables for marketable yield of indicated potato types are:

White and Red varieties (Freeville): 1 7/8 to 4" in diameter.

White (County Trials): 2 to 4" in diameter.

Russet (all Trials): 4 to 16 ounces.

Percent of total yield is the weight of a specific size category divided by total yield (including defects). The letter codes for the various sizes correspond to the following parameters:

White and Red Varieties (Freeville):

A = 0 to 1 7/8" in diameter

B = 1 7/8 to 2 1/2"

C = 2 1/2 to 3 1/4"

D = 3 1/4 to 4"

E = over 4"

White (County Trials): A = 0 to 2" in diameter

B = 2 to 4"

C = over 4"

Russet (all Trials): A = 0 to 4 ounces

B = 4 to 8

C = 8 to 12

D = 12 to 16

E = over 16

External defects (EXT DEF) is comprised of four classes of defects: G = green

C = growth crack

M = misshapen or knobby

R = rot

Internal defects (INT DEF) represents the number of tubers examined out of 40 which when cut in half showed significant symptoms of the four following defects:

H = hollow heart

S = stem-end rot

V = vascular discoloration

N = internal necrosis

Specific gravity (SPEC GRAV) was determined by potato hydrometer. A "1.0" has been dropped from entries which had readings in the hundreths place, while a "1." has been omitted from those which had readings in the tenths position.

General external appearance (GEN APP) was subjectively evaluated using the following scale:

1 = extremely rough or unattractive

9 = very smooth and attractive

Vine maturity ratings (MAT) were also subjectively evaluated but only on the Freeville trials. These ratings, which were made just a day or two prior to vine killing, were based on the scale: 1 = all plants completely dead

9 = all plants full green

UPSTATE NEW YORK TABLE 1. EARLY MATURITY VARIETY TRIAL
FREEVILLE, NEW YORK, 1985

| VARIETY OR CLONE | YIELD(CWT/A) | | % SUP YIELD | PCT OF TOTAL YIELD | | | | | YIELD | | TUBER #/FT | AVG TUBER WT(OZ.) | INT | | | | SPEC GRAV | GEN APP | MAT |
|------------------------|--------------|------|----------------|--------------------|-----|------|----|---|------------|-----|---------------|-------------------------|-----|---|---|---|--------------|------------|-----|
| | TOTAL | MKT | | MKT | MKT | | | | EXT DEF | DEF | | | DEF | | | | | | |
| | | | | | A | B | C | D | | | | | E | H | V | S | | | |
| NY80 | 457 | 425 | 134 | 6 | 25 | 60 | 8 | 0 | 1 | 1 | 9.8 | 4.8 | 1 | 0 | 0 | 0 | 77 | 6.6 | 3.3 |
| NY76 | 441 | 401 | 127 | 5 | 14 | 57 | 20 | 0 | 5 | 5 | 9.0 | 5.1 | 0 | 0 | 0 | 1 | 78 | 6.1 | 2.5 |
| CS7639-1 | 435 | 391 | 124 | 3 | 14 | 57 | 18 | 1 | 6 | 6 | 7.7 | 5.9 | 3 | 0 | 0 | 3 | 80 | 6.0 | 3.0 |
| NY71 | 433 | 387 | 123 | 2 | 8 | 51 | 31 | 3 | 6 | 6 | 7.2 | 6.3 | 2 | 0 | 0 | 0 | 87 | 5.9 | 4.8 |
| B8710-1 | 440 | 380 | 120 | 4 | 16 | 55 | 15 | 0 | 10 | C | 7.9 | 5.8 | 1 | 0 | 0 | 2 | 81 | 6.1 | 3.3 |
| NY82 | 411 | 366 | 116 | 3 | 9 | 47 | 34 | 2 | 6 | 6 | 6.9 | 6.2 | 0 | 0 | 1 | 0 | 76 | 6.1 | 6.0 |
| CF7523-1 | 412 | 363 | 115 | 6 | 18 | 55 | 15 | 2 | 4 | M | 8.3 | 5.1 | 0 | 0 | 0 | 0 | 85 | 6.4 | 5.3 |
| CARIBE | 410 | 355 | 112 | 4 | 13 | 51 | 23 | 2 | 8 | M | 6.7 | 6.4 | 0 | 0 | 1 | 0 | 79 | 5.9 | 2.8 |
| NY79 | 350 | 333 | 105 | 3 | 14 | 61 | 20 | 0 | 1 | 1 | 6.7 | 5.4 | 0 | 0 | 0 | 0 | 78 | 6.9 | 1.5 |
| MONONA | 352 | 330 | 105 | 3 | 15 | 66 | 13 | 1 | 2 | 4 | 6.9 | 5.3 | 6 | 0 | 0 | 0 | 84 | 5.8 | 4.8 |
| SUPERIOR | 350 | 316 | 100 | 4 | 12 | 64 | 14 | 1 | 4 | 2 | 7.1 | 5.1 | 0 | 0 | 1 | 0 | 83 | 6.1 | 1.8 |
| B9933-19 | 378 | 310 | 98 | 16 | 48 | 30 | 4 | 0 | 2 | 2 | 6.8 | 5.8 | 0 | 0 | 0 | 0 | 82 | 6.3 | 2.0 |
| NORLAND | 345 | 303 | 96 | 7 | 24 | 56 | 9 | 0 | 5 | 5 | 7.9 | 4.6 | 0 | 0 | 0 | 0 | 70 | 5.9 | 1.5 |
| YUKON GOLD | 336 | 301 | 95 | 2 | 10 | 56 | 23 | 2 | 6 | C | 5.8 | 6.2 | 0 | 0 | 0 | 0 | 89 | 6.8 | 1.5 |
| CF77154-10 | 338 | 298 | 94 | 6 | 23 | 61 | 5 | 0 | 6 | 6 | 7.7 | 4.5 | 0 | 0 | 0 | 0 | 79 | 6.0 | 1.0 |
| CF7679-15 | 361 | 294 | 93 | 2 | 8 | 43 | 31 | 5 | 11 | C | 5.3 | 7.2 | 1 | 0 | 0 | 0 | 91 | 5.9 | 6.5 |
| SUNRISE | 384 | 294 | 93 | 5 | 10 | 46 | 21 | 3 | 16 | C | 6.6 | 6.0 | 0 | 0 | 0 | 0 | 78 | 6.0 | 3.0 |
| NY74 | 350 | 286 | 90 | 9 | 32 | 48 | 2 | 0 | 9 | C | 8.8 | 4.1 | 0 | 0 | 0 | 0 | 88 | 6.0 | 1.0 |
| B9340-13 | 312 | 276 | 87 | 6 | 27 | 50 | 12 | 0 | 5 | 5 | 6.8 | 4.8 | 0 | 0 | 0 | 0 | 81 | 6.0 | 1.0 |
| B9933-9 | 372 | 274 | 87 | 19 | 48 | 23 | 3 | 1 | 6 | 6 | 6.7 | 5.7 | 0 | 0 | 0 | 0 | 83 | 6.3 | 3.5 |
| B0011-3 | 310 | 272 | 86 | 3 | 12 | 57 | 18 | 0 | 9 | C | 6.0 | 5.3 | 3 | 0 | 0 | 0 | 93 | 5.5 | 4.3 |
| WALLER-DUNCAN | | | | | | | | | | | | | | | | | | | |
| LSD (.05) | 54 | 48 | | | 0.8 | 0.8 | | | | | 0.8 | 0.8 | | | | | 3 | | |
| C.V. (%) | (10) | (11) | | | (9) | (10) | | | | | (9) | (10) | | | | | (3) | | |

PLANT DATE - APRIL 29
VINE KILL DATE - AUGUST 19 (MOWED)
HARVEST DATE - AUGUST 22

UPSTATE NEW YORK TABLE 2. MEDIUM MATURITY VARIETY TRIAL
FREEVILLE, NEW YORK, 1985

| VARIETY OR CLONE | YIELD(CWT/A) | | % KAT YIELD | | PCT OF TOTAL YIELD | | | | | TUBER | | AVG | INT | | | | SPEC GRAV | GEN APP | MAT | |
|--|--------------|------|----------------|-----|--------------------|----|----|---|----|-------|--------|-----|-----|---|---|-----|--------------|------------|-----|---|
| | TOTAL | MKT | MKT | MKT | MKT | | | | | #/FT | WT(OZ) | DEF | | | | | | | | |
| | | | | | A | B | C | D | E | | | EXT | DEF | H | V | S | | | | N |
| | | | | | | | | | | | | | | | | | | | | |
| KATAHDIN F74123 NY78 NY77 | 481 | 443 | 100 | 2 | 8 | 54 | 30 | 1 | 4 | 7.4 | 7.0 | 0 | 0 | 0 | 0 | 83 | 6.1 | 8.0 | | |
| | 483 | 437 | 99 | 3 | 10 | 54 | 27 | 2 | 5 | 7.4 | 6.8 | 0 | 0 | 0 | 0 | 79 | 6.0 | 5.5 | | |
| | 453 | 422 | 95 | 2 | 7 | 52 | 35 | 1 | 4 | 6.9 | 6.9 | 0 | 0 | 0 | 0 | 77 | 6.6 | 8.3 | | |
| | 443 | 417 | 94 | 2 | 11 | 50 | 33 | 2 | 2 | 7.2 | 6.4 | 0 | 0 | 0 | 0 | 81 | 6.1 | 3.5 | | |
| ATLANTIC MONONA B9955-28 CF7688-9 | 408 | 350 | 79 | 2 | 4 | 34 | 47 | 4 | 10 | 5.6 | 7.5 | 0 | 0 | 0 | 3 | 98 | 5.9 | 7.0 | | |
| | 375 | 349 | 79 | 4 | 16 | 57 | 20 | 1 | 2 | 7.7 | 5.1 | 2 | 0 | 0 | 0 | 79 | 6.1 | 5.5 | | |
| | 387 | 340 | 77 | 2 | 8 | 47 | 33 | 0 | 9 | 6.0 | 6.7 | 3 | 0 | 0 | 0 | 76 | 5.6 | 1.3 | | |
| | 368 | 312 | 70 | 2 | 13 | 40 | 31 | 0 | 13 | 6.4 | 6.0 | 3 | 0 | 0 | 0 | 90 | 5.3 | 5.0 | | |
| B9792-28 B9140-32 B9792-197 B9192-1 | 372 | 293 | 66 | 2 | 7 | 40 | 31 | 6 | 14 | 5.0 | 7.8 | 0 | 0 | 0 | 0 | 90 | 5.6 | 5.0 | | |
| | 331 | 268 | 60 | 3 | 7 | 40 | 32 | 3 | 15 | 5.9 | 5.9 | 0 | 0 | 0 | 0 | 90 | 5.6 | 7.0 | | |
| | 313 | 267 | 60 | 3 | 11 | 51 | 23 | 0 | 11 | 5.3 | 6.1 | 0 | 0 | 0 | 0 | 91 | 5.8 | 4.3 | | |
| | 399 | 198 | 45 | 2 | 5 | 20 | 24 | 2 | 46 | 5.5 | 7.6 | 0 | 0 | 0 | 0 | 83 | 6.1 | 5.0 | | |
| WALLER-DUNCAN | | | | | | | | | | | | | | | | | | | | |
| LSD (.05) | 77 | 74 | | | | | | | | 1.1 | 1.8 | | | | | 5 | | | | |
| C.V. (%) | (13) | (16) | | | | | | | | (12) | (15) | | | | | (4) | | | | |

PLANT DATE - MAY 2
VINE KILL DATE - AUGUST 29
HARVEST DATE - SEPTEMBER 11

UPSTATE NEW YORK TABLE 3. LATE MATURITY VARIETY TRIAL
FREEVILLE, NEW YORK, 1985

| VARIETY OR CLONE | YIELD(CWT/A) TOTAL | % KAT YIELD MKT | PCT OF TOTAL YIELD | | | | TUBER #/FT | AVG TUBER WT(OZ) | INT DEF | | | | SPEC GRAY | GEN APP | MAT |
|------------------------|-----------------------|-----------------------|--------------------|------|----|----|---------------|------------------------|------------|---|---|----|--------------|------------|-----|
| | | | A | B | C | D | | | H | V | S | N | | | |
| NY72 | 517 | 475 | 1 | 7 | 49 | 36 | 3 | 4 | 0 | 0 | 0 | 0 | 90 | 6.8 | 5.3 |
| AF303-5 | 508 | 456 | 1 | 6 | 45 | 39 | 8 | 2 | 1 | 0 | 0 | 25 | 87 | 5.5 | 7.3 |
| ELBA | 494 | 452 | 1 | 8 | 53 | 30 | 5 | 2 | 0 | 0 | 0 | 2 | 89 | 6.1 | 7.3 |
| KATAHDIN | 448 | 432 | 1 | 10 | 62 | 25 | 0 | 2 | 0 | 0 | 0 | 0 | 85 | 6.0 | 4.5 |
| C-14 | 439 | 415 | 2 | 14 | 59 | 22 | 0 | 3 | 0 | 0 | 0 | 0 | 87 | 5.4 | 3.8 |
| DELTA GOLD | 461 | 410 | 1 | 9 | 46 | 35 | 4 | 6 | 0 | 0 | 0 | 1 | 92 | 5.5 | 6.5 |
| F73008 | 468 | 404 | 2 | 17 | 47 | 23 | 2 | 9 C | 1 | 5 | 0 | 0 | 88 | 5.5 | 7.3 |
| NY64 | 462 | 396 | 2 | 16 | 60 | 10 | 0 | 13 C | 0 | 0 | 0 | 1 | 85 | 5.9 | 1.3 |
| NY81 | 505 | 385 | 1 | 5 | 30 | 44 | 14 | 7 | 1 | 1 | 1 | 0 | 84 | 5.6 | 5.0 |
| SHEPODY | 444 | 367 | 2 | 13 | 47 | 23 | 8 | 8 M | 1 | 0 | 0 | 0 | 88 | 4.5 | 2.5 |
| AF474-2 | 417 | 364 | 2 | 10 | 50 | 28 | 1 | 9 C | 0 | 0 | 4 | 0 | 81 | 5.6 | 2.0 |
| B9935-14 | 391 | 354 | 1 | 6 | 49 | 37 | 0 | 8 C | 1 | 0 | 0 | 0 | 78 | 5.6 | 1.3 |
| B9955-46 | 382 | 352 | 0 | 7 | 39 | 47 | 3 | 4 | 2 | 0 | 1 | 0 | 84 | 6.0 | 1.0 |
| NY75 | 370 | 340 | 1 | 13 | 56 | 23 | 0 | 7 | 3 | 0 | 0 | 0 | 94 | 4.6 | 1.8 |
| HAMPTON | 409 | 340 | 1 | 10 | 44 | 31 | 2 | 11 C | 0 | 0 | 1 | 0 | 80 | 5.5 | 2.3 |
| B9988-7 | 382 | 318 | 2 | 11 | 41 | 31 | 2 | 13 C | 1 | 0 | 0 | 0 | 85 | 5.1 | 2.3 |
| MONONA | 321 | 312 | 2 | 20 | 67 | 11 | 1 | 1 | 2 | 0 | 0 | 0 | 80 | 6.0 | 1.5 |
| B9792-1B | 322 | 296 | 2 | 12 | 62 | 17 | 1 | 6 | 1 | 1 | 0 | 0 | 85 | 5.1 | 1.0 |
| B9935-8 | 338 | 284 | 1 | 4 | 31 | 49 | 8 | 7 C | 1 | 0 | 0 | 0 | 77 | 5.6 | 1.3 |
| B9792-149 | 403 | 279 | 3 | 9 | 38 | 23 | 1 | 27 C,M | 0 | 0 | 0 | 0 | 88 | 4.9 | 3.0 |
| B9792-144 | 311 | 270 | 2 | 8 | 54 | 24 | 0 | 11 C | 3 | 0 | 0 | 0 | 77 | 5.4 | 1.3 |
| B9955-11 | 329 | 269 | 4 | 11 | 42 | 29 | 0 | 15 C | 0 | 1 | 0 | 0 | 90 | 5.8 | 2.0 |
| B9792-132 | 308 | 264 | 2 | 12 | 45 | 29 | 0 | 12 C | 5 | 0 | 0 | 0 | 88 | 5.3 | 1.8 |
| B9955-33 | 287 | 259 | 2 | 8 | 53 | 29 | 0 | 8 | 0 | 0 | 0 | 0 | 91 | 6.0 | 1.0 |
| CF76183-2 | 328 | 256 | 4 | 24 | 41 | 13 | 2 | 16 C | 0 | 2 | 0 | 0 | 75 | 5.0 | 1.0 |
| B9955-10 | 255 | 233 | 5 | 33 | 57 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 93 | 6.1 | 1.0 |
| B9962-2 | 275 | 231 | 3 | 14 | 58 | 11 | 0 | 13 C | 1 | 0 | 0 | 0 | 83 | 5.3 | 1.3 |
| WALLER-DUNCAN | 62 | 52 | 0.9 | 0.9 | | | | | | | | | 4 | | |
| LSD (.05) | | | (11) | (10) | | | | | | | | | (4) | | |
| C.V. (%) | (12) | (12) | | | | | | | | | | | | | |

PLANT DATE - APRIL 29
VINE KILL DATE - SEPTEMBER 6
HARVEST DATE - SEPTEMBER 16-17

UPSTATE NEW YORK TABLE 4. RUSSET VARIETY TRIAL
FREEVILLE, NEW YORK, 1985

| VARIETY OR CLONE | YIELD(CWT/A) | | %NORG YIELD | PCT OF TOTAL YIELD | | | | | YIELD | | EXT DEF | TUBER #/FT | AVG TUBER WT(OZ) | INT | | | | SPEC GRAV | GEN APP | MAT | |
|------------------------|--------------|------|----------------|--------------------|-----|----|----|----|-------|-----|------------|---------------|------------------------|-----|---|---|---|--------------|------------|-----|--|
| | TOTAL | MKT | | MKT | MKT | | | | | DEF | | | | H | V | S | N | | | | |
| | | | | | A | B | C | D | E | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| ACADIA | 434 | 324 | 228 | 8 | 31 | 29 | 14 | 15 | 2 | | | 5.7 | 8.0 | 1 | 0 | 0 | 0 | 85 | 5.3 | 4.3 | |
| NEMARUS | 349 | 258 | 181 | 21 | 45 | 22 | 7 | 0 | 6 | | | 6.1 | 6.0 | 0 | 0 | 0 | 0 | 83 | 5.8 | 1.0 | |
| ND534-4 | 329 | 246 | 173 | 22 | 52 | 19 | 4 | 1 | 3 | | | 6.0 | 5.8 | 0 | 0 | 0 | 0 | 85 | 6.5 | 1.0 | |
| B9596-2 | 319 | 242 | 170 | 17 | 43 | 25 | 8 | 1 | 7 | C | | 5.4 | 6.2 | 0 | 0 | 0 | 0 | 87 | 5.9 | 1.0 | |
| ND388-1 | 335 | 240 | 169 | 25 | 58 | 12 | 1 | 0 | 3 | | | 6.8 | 5.1 | 1 | 0 | 0 | 0 | 90 | 5.9 | 1.0 | |
| WF591-1R | 310 | 219 | 154 | 20 | 53 | 15 | 3 | 1 | 7 | C | | 6.1 | 5.3 | 0 | 0 | 0 | 0 | 90 | 4.9 | 1.0 | |
| B9569-2 | 295 | 188 | 132 | 31 | 49 | 12 | 3 | 0 | 5 | | | 6.2 | 5.0 | 0 | 0 | 0 | 0 | 85 | 6.4 | 1.0 | |
| B9391-2 | 310 | 183 | 129 | 22 | 32 | 18 | 10 | 5 | 15 | C | | 5.4 | 6.0 | 1 | 0 | 0 | 0 | 82 | 6.0 | 1.0 | |
| B9398-2 | 285 | 162 | 114 | 13 | 24 | 21 | 10 | 5 | 26 | C,M | | 4.6 | 6.5 | 0 | 0 | 0 | 1 | 91 | 6.0 | 1.3 | |
| B9959-18 | 335 | 161 | 114 | 13 | 30 | 13 | 6 | 1 | 37 | C | | 5.4 | 6.5 | 0 | 0 | 0 | 0 | 86 | 5.6 | 1.0 | |
| B0012-1 | 217 | 143 | 101 | 29 | 51 | 14 | 2 | 0 | 4 | | | 4.5 | 5.0 | 0 | 0 | 0 | 0 | 85 | 5.8 | 1.3 | |
| NORGOLD | 270 | 142 | 100 | 42 | 44 | 8 | 1 | 1 | 4 | | | 6.1 | 4.6 | 3 | 0 | 0 | 0 | 81 | 5.1 | 1.0 | |
| WALLER-DUNCAN | | | | | | | | | | | | | | | | | | | | | |
| LSD (.05) | 36 | 43 | | | | | | | | | | 0.6 | 0.6 | | | | | 4 | | | |
| C.V. (%) | (8) | (15) | | | | | | | | | | (7) | (8) | | | | | (3) | | | |

PLANT DATE - APRIL 29
VINE KILL DATE - SEPTEMBER 6
HARVEST DATE - SEPTEMBER 16-17

UPSTATE NEW YORK TABLE 5. CORNELL GOLDEN NEMATODE RESISTANT CLONES TRIAL
FREEVILLE, NEW YORK, 1985

| VARIETY OR CLONE | YIELD(CWT/A) | | % KAT YIELD | PCT OF TOTAL YIELD | | | | | | | TUBER #/FT | AVG TUBER WT(OZ) | INT | | | | SPEC GRAV | GEN APP | MAT |
|----------------------------|--------------|------|----------------|--------------------|-----|----|----|---|--------|------------|---------------|------------------------|-----|---|---|-----|--------------|------------|-----|
| | TOTAL | MKT | | MKT | MKT | | | | | EXT DEF | | | DEF | | | | | | |
| | | | | | A | B | C | D | E | | | | H | V | S | N | | | |
| C120-7 | 464 | 409 | 110 | 4 | 15 | 59 | 14 | 0 | 7 | 8.1 | 5.9 | 0 | 0 | 0 | 0 | 82 | 6.3 | 2.3 | |
| BCS166-1 | 463 | 391 | 106 | 3 | 15 | 49 | 23 | 2 | 9 | 7.2 | 6.5 | 0 | 0 | 1 | 0 | 95 | 6.1 | 4.0 | |
| KATAHDIN | 416 | 370 | 100 | 3 | 14 | 46 | 29 | 2 | 6 | 7.5 | 5.8 | 0 | 1 | 0 | 0 | 84 | 6.4 | 8.0 | |
| C64-16 | 441 | 368 | 99 | 4 | 7 | 49 | 28 | 0 | 12 R | 6.7 | 6.9 | 2 | 0 | 0 | 0 | 82 | 5.8 | 6.5 | |
| C114-6 | 434 | 357 | 97 | 4 | 8 | 49 | 27 | 5 | 7 | 6.6 | 6.8 | 2 | 0 | 4 | 0 | 86 | 5.1 | 4.0 | |
| ATLANTIC | 405 | 355 | 96 | 4 | 10 | 50 | 27 | 1 | 7 | 6.8 | 6.2 | 1 | 0 | 0 | 0 | 101 | 5.9 | 7.0 | |
| C61-6 | 433 | 352 | 95 | 5 | 11 | 43 | 29 | 2 | 12 C | 7.1 | 6.4 | 0 | 0 | 0 | 0 | 79 | 6.3 | 2.8 | |
| MONONA | 346 | 307 | 83 | 8 | 24 | 56 | 8 | 0 | 3 | 7.8 | 4.6 | 2 | 0 | 0 | 0 | 82 | 5.1 | 6.8 | |
| B35-39 | 363 | 296 | 80 | 6 | 9 | 45 | 28 | 2 | 10 C | 5.9 | 6.4 | 2 | 0 | 0 | 0 | 96 | 5.8 | 5.3 | |
| C121-1 | 337 | 295 | 80 | 3 | 14 | 58 | 16 | 0 | 9 R | 6.0 | 5.8 | 0 | 0 | 4 | 0 | 87 | 5.5 | 4.0 | |
| B35-81 | 360 | 286 | 77 | 9 | 19 | 43 | 17 | 4 | 8 | 7.2 | 5.1 | 0 | 0 | 0 | 0 | 88 | 4.1 | 3.0 | |
| C63-9 | 404 | 277 | 75 | 11 | 15 | 43 | 10 | 0 | 20 C | 8.6 | 4.9 | 1 | 0 | 1 | 0 | 78 | 5.8 | 2.8 | |
| B24-9 | 357 | 267 | 72 | 7 | 15 | 44 | 16 | 0 | 17 M,G | 6.6 | 5.7 | 0 | 0 | 1 | 0 | 84 | 5.0 | 5.0 | |
| C163-8 | 347 | 228 | 61 | 14 | 14 | 40 | 12 | 0 | 20 C | 7.3 | 4.9 | 4 | 0 | 2 | 0 | 73 | 5.0 | 6.0 | |
| C92-1 | 297 | 216 | 58 | 21 | 42 | 29 | 3 | 0 | 5 | 7.7 | 4.2 | 0 | 0 | 0 | 0 | 91 | 4.3 | 2.3 | |
| WALLER-DUNCAN LSD (.05) | 87 | 76 | | | | | | | | 1.2 | 1.5 | | | | | 7 | | | |
| C.V (%) | (14) | (16) | | | | | | | | (11) | (16) | | | | | (6) | | | |

PLANT DATE - MAY 3
VINE KILL DATE - AUGUST 29
HARVEST DATE - SEPTEMBER 13

UPSTATE NEW YORK TABLE 6. ORLEANS COUNTY MUCK SOIL VARIETY TRIAL
ELBA, NEW YORK, 1985

| VARIETY OR CLONE | CLASS | YIELD(CWT/A) | | % KAT YIELD MKT | PCT OF TOTAL YIELD | | | | | | INT DEF | | | | SPEC GRAV |
|------------------------|-------|--------------|------|-----------------------|--------------------|----|----|----|----|------------|------------|---|---|---|--------------|
| | | TOTAL | MKT | | A | B | C | D | E | EXT DEF | H | V | S | N | |
| ELBA | W | 444 | 397 | 123 | 3 | 89 | 7 | - | - | 1 | 0 | 0 | 0 | 0 | 67 |
| B8710-1 | W | 390 | 340 | 105 | 3 | 87 | 0 | - | - | 10 G | 0 | 1 | 0 | 0 | 67 |
| KATAHDIN | W | 409 | 322 | 100 | 1 | 78 | 8 | - | - | 12 G | 0 | 0 | 0 | 0 | 65 |
| NY71 | W | 423 | 314 | 97 | 1 | 75 | 18 | - | - | 6 G | 0 | 0 | 0 | 0 | 66 |
| NY64 | W | 360 | 306 | 95 | 5 | 85 | 1 | - | - | 9 G | 0 | 0 | 0 | 0 | 65 |
| HAMPTON | W | 351 | 295 | 92 | 2 | 85 | 6 | - | - | 7 G | 0 | 0 | 0 | 1 | 60 |
| ND388-1 | R | 310 | 232 | 72 | 22 | 42 | 29 | 5 | 1 | 2 | 0 | 1 | 0 | 0 | 67 |
| ACADIA | R | 324 | 221 | 69 | 10 | 25 | 32 | 11 | 13 | 10 G | 0 | 0 | 1 | 0 | 65 |
| NEMARUS | R | 323 | 192 | 60 | 13 | 31 | 19 | 11 | 11 | 16 G | 0 | 0 | 0 | 0 | 64 |
| B9391-2 | R | 251 | 171 | 53 | 17 | 39 | 21 | 8 | 4 | 11 G | 0 | 2 | 0 | 0 | 64 |
| ND534-4 | R | 250 | 161 | 50 | 24 | 51 | 9 | 4 | 0 | 12 G | 0 | 0 | 0 | 0 | 65 |
| NORGOLD | R | 223 | 98 | 30 | 47 | 37 | 5 | 0 | 0 | 11 G | 0 | 0 | 0 | 0 | 64 |
| <hr/> | | | | | | | | | | | | | | | |
| WALLER-DUNCAN | | | | | | | | | | | | | | | |
| LSD (.05) | | 34 | 32 | | | | | | | | | | | | 3 |
| C.V. (%) | | (8) | (10) | | | | | | | | | | | | (3) |

PLANT DATE - MAY 29

VINE KILL DATES - SEPTEMBER 16, SEPTEMBER 23

HARVEST DATE - OCTOBER 16

FERTILIZATION - 1000 LB/A 10-30-29 PLUS 300 LB/A POTASH BROADCAST
BEFORE PLANTING. 160 LB/A AMMONIUM NITRATE
SIDE-DRESSED SIX WEEKS AFTER PLANTING.

VINE KILL - TWO APPLICATIONS OF DIQUAT 1 PT/A + X77 SURFACTANT

UPSTATE NEW YORK TABLE 7. WAYNE COUNTY MUCK SOIL VARIETY TRIAL
SAVANNAH, NEW YORK, 1985

| VARIETY OR CLONE | CLASS | YIELD(CWT/A) | | % KAT YIELD MKT | PCT OF TOTAL YIELD | | | | | EXT DEF | INT DEF | | | | SPEC GRAY |
|------------------------|-------|--------------|------|-----------------------|--------------------|----|----|----|----|------------|------------|---|---|----|--------------|
| | | TOTAL | MKT | | A | B | C | D | E | | H | V | S | N | |
| ELBA | W | 819 | 688 | 140 | 2 | 84 | 6 | - | - | 7 G | 0 | 0 | 0 | 10 | 82 |
| NY72 | W | 725 | 591 | 120 | 4 | 82 | 5 | - | - | 10 G | 0 | 0 | 0 | 0 | 82 |
| NY81 | W | 674 | 576 | 117 | 2 | 85 | 8 | - | - | 5 G | 1 | 1 | 0 | 1 | 87 |
| NY78 | W | 613 | 529 | 108 | 5 | 86 | 1 | - | - | 8 G | 0 | 0 | 0 | 0 | 78 |
| AF303-5 | W | 594 | 523 | 107 | 6 | 87 | 3 | - | - | 3 | 0 | 0 | 0 | 10 | 84 |
| KATAHDIN | W | 638 | 491 | 100 | 3 | 77 | 7 | - | - | 12 G | 0 | 0 | 0 | 0 | 78 |
| NY71 | W | 555 | 481 | 98 | 4 | 87 | 2 | - | - | 7 G | 0 | 0 | 0 | 0 | 83 |
| HAMPTON | W | 528 | 465 | 95 | 4 | 88 | 3 | - | - | 6 G | 1 | 0 | 0 | 2 | 78 |
| NY77 | W | 545 | 461 | 94 | 5 | 86 | 1 | - | - | 8 G | 1 | 0 | 0 | 0 | 78 |
| ND388-1 | R | 488 | 424 | 86 | 9 | 43 | 33 | 11 | 4 | 0 | 0 | 0 | 0 | 3 | 86 |
| ACADIA | R | 571 | 352 | 72 | 3 | 21 | 20 | 21 | 24 | 11 G | 0 | 0 | 0 | 0 | 77 |
| NY64 | W | 387 | 314 | 64 | 12 | 80 | 0 | - | - | 8 G | 0 | 1 | 0 | 0 | 80 |
| NY80 | W | 380 | 303 | 62 | 16 | 80 | 0 | - | - | 4 | 0 | 0 | 0 | 0 | 74 |
| NY82 | W | 347 | 296 | 60 | 8 | 86 | 2 | - | - | 4 | 0 | 0 | 0 | 1 | 77 |
| NY75 | W | 359 | 293 | 60 | 12 | 82 | 0 | - | - | 6 | 0 | 0 | 0 | 0 | 81 |
| B8710-1 | W | 353 | 288 | 59 | 12 | 81 | 0 | - | - | 7 G | 0 | 0 | 0 | 0 | 81 |
| NY76 | W | 330 | 276 | 56 | 15 | 82 | 0 | - | - | 4 | 0 | 0 | 0 | 0 | 76 |
| SUPERIOR | W | 332 | 276 | 56 | 11 | 84 | 0 | - | - | 5 G | 0 | 0 | 0 | 0 | 73 |
| ND534-4 | R | 314 | 268 | 55 | 8 | 52 | 26 | 8 | 3 | 3 | 0 | 0 | 0 | 0 | 72 |
| NY74 | W | 353 | 261 | 53 | 19 | 74 | 0 | - | - | 7 G | 0 | 0 | 0 | 0 | 89 |
| NEMARUS | R | 351 | 246 | 50 | 10 | 28 | 32 | 10 | 6 | 13 G | 0 | 0 | 0 | 0 | 76 |
| NY79 | W | 301 | 241 | 49 | 14 | 79 | 0 | - | - | 7 G | 0 | 0 | 0 | 0 | 70 |
| NORGOLD | R | 303 | 239 | 49 | 7 | 45 | 25 | 9 | 2 | 12 G | 0 | 0 | 0 | 0 | 76 |
| B9391-2 | R | 222 | 169 | 34 | 16 | 49 | 21 | 8 | 2 | 5 | 0 | 0 | 0 | 0 | 72 |
| <hr/> | | | | | | | | | | | | | | | |
| WALLER-DUNCAN | | | | | | | | | | | | | | | |
| LSD (.05) | | 100 | 94 | | | | | | | | | | | | 4 |
| C.V. (%) | | (17) | (19) | | | | | | | | | | | | (4) |

PLANT - MAY 6 VINE KILL - SEPTEMBER 9 HARVEST - SEPTEMBER 23
 FERTILIZATION - AT PLANTING 1300 LB/A 11.2N-7.7P205-11.5K20-0.15B-0.07CU-
 0.38MN-3.08MG-16.3S-0.22ZN. TWO FOLIAR APPLICATIONS
 OF NUTRA-LEAF 20-20-20 WERE MADE AT THE RATE OF 5 LB/A.
 VINE KILL - ONE APPLICATION OF DOW GENERAL AT 2 QT/A

UPSTATE NEW YORK TABLE 8. STEUBEN COUNTY MINERAL SOIL VARIETY TRIAL
LOON LAKE, NEW YORK, 1985

| VARIETY OR CLONE | YIELD(CWT/A) | | % ATL | % OF TOT YIELD | | | | INT | | | | SPEC GRAV | |
|------------------------|--------------|------|--------------|----------------|----|---|------------|-----|---|---|---|--------------|-----|
| | TOTAL | MKT | YIELD MKT | MKT | | | EXT DEF | DEF | | | | | |
| | | | | A | B | C | | H | V | S | N | | |
| NY72 | 513 | 437 | 114 | 3 | 86 | 5 | 7 | G | 0 | 0 | 0 | 0 | 82 |
| ATLANTIC | 434 | 385 | 100 | 5 | 89 | 1 | 6 | | 0 | 1 | 0 | 0 | 91 |
| NY71 | 390 | 339 | 88 | 5 | 87 | 1 | 8 | G | 0 | 0 | 0 | 0 | 78 |
| B8710-1 | 373 | 314 | 82 | 8 | 84 | 0 | 8 | G | 0 | 0 | 0 | 0 | 81 |
| MONONA | 306 | 272 | 71 | 6 | 89 | 0 | 5 | G | 0 | 0 | 0 | 0 | 76 |
| B0011-3 | 302 | 258 | 67 | 6 | 85 | 0 | 8 | G | 0 | 0 | 0 | 0 | 92 |
| B9140-32 | 295 | 256 | 67 | 6 | 86 | 0 | 7 | G | 0 | 0 | 2 | 0 | 84 |
| B9192-1 | 310 | 240 | 62 | 5 | 77 | 0 | 18 | C | 0 | 0 | 0 | 0 | 82 |
| NY74 | 316 | 236 | 61 | 18 | 74 | 0 | 7 | | 0 | 0 | 0 | 0 | 88 |
| B9340-13 | 243 | 183 | 48 | 11 | 75 | 0 | 14 | G | 0 | 0 | 0 | 0 | 87 |
| | | | | | | | | | | | | | |
| WALLER-DUNCAN | | | | | | | | | | | | | |
| LSD (.05) | 56 | 51 | | | | | | | | | | | 3 |
| C.V. (%) | (12) | (13) | | | | | | | | | | | (3) |

PLANT DATE - MAY 15

VINE KILL DATE - (NATURAL DIE-DOWN)

HARVEST DATE - SEPTEMBER 30

FERTILIZATION - PLOWED DOWN 294 LB/A 10-34-0 AND 75 LB/A
POTASSIUM. BROADCAST 75 LB/A POTASSIUM AT
PLANTING. SIDE-DRESSED 60 LB/A N AT 3" STAGE.

UPSTATE NEW YORK TABLE 9. WYOMING COUNTY MINERAL SOIL VARIETY TRIAL
GAINESVILLE, NEW YORK, 1985

| VARIETY OR CLONE | CLASS | YIELD(CWT/A) | | % ATL YIELD MKT | PCT OF TOTAL YIELD | | | | | EXT DEF | INT DEF | | | | SPEC GRAY |
|------------------------|-------|--------------|------|-----------------------|--------------------|----|----|---|---|------------|------------|---|---|---|--------------|
| | | TOTAL | MKT | | A | B | C | D | E | | H | V | S | N | |
| B9192-1 | W | 237 | 220 | 142 | 6 | 92 | 0 | - | - | 1 | 0 | 0 | 0 | 0 | 93 |
| NY81 | W | 220 | 196 | 127 | 10 | 89 | 1 | - | - | 1 | 0 | 0 | 0 | 0 | 91 |
| MONONA | W | 190 | 161 | 104 | 14 | 84 | 0 | - | - | 2 | 0 | 0 | 0 | 0 | 87 |
| ACADIA | R | 190 | 158 | 102 | 16 | 52 | 26 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 85 |
| ATLANTIC | W | 196 | 155 | 100 | 21 | 78 | 0 | - | - | 1 | 0 | 1 | 0 | 0 | 94 |
| B9340-13 | W | 202 | 147 | 95 | 27 | 72 | 0 | - | - | 1 | 0 | 0 | 0 | 0 | 91 |
| B0011-3 | W | 164 | 135 | 87 | 14 | 82 | 0 | - | - | 4 | 0 | 0 | 0 | 0 | 99 |
| B9140-32 | W | 183 | 132 | 85 | 27 | 71 | 0 | - | - | 1 | 0 | 0 | 0 | 0 | 101 |
| B9391-2 | R | 180 | 124 | 80 | 31 | 55 | 10 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 89 |
| NEMARUS | R | 184 | 103 | 66 | 44 | 50 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 89 |
| ND388-1 | R | 182 | 90 | 58 | 50 | 46 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 94 |
| ND534-4 | R | 137 | 76 | 49 | 44 | 51 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 85 |
| WALLER-DUNCAN | | | | | | | | | | | | | | | |
| LSD (.05) | | 34 | 29 | | | | | | | | | | | | 3 |
| C.V. (%) | | (12) | (15) | | | | | | | | | | | | (3) |

PLANT DATE - MAY 17

VINE KILL DATE - SEPTEMBER 10

HARVEST DATE - SEPTEMBER 26

FERTILIZATION - 1700 LB/A OF 8-12-10 AT PLANTING

VINE KILL - ONE APPLICATION OF DOW GENERAL AT 2 QT/A

NEW YORK

R. L. Plaisted and H. D. Thurston

Crossing and Seedling Production: In 1985, 82 crosses were made for variety selection purposes. These all segregate for resistance to the golden nematode (GN). Emphasis again this year was on producing clones with chipping quality and long russet clones. In germplasm development, 51 crosses were made as part of the trichome project, 13 were neotbr x neotbr crosses, 41 were crosses in the heat tolerant, bacterial wilt, and root knot (M. arenaria) resistant population, 13 were crosses with clones resistant to M. hapla and M. chitwoodi, and 19 were crosses with clones resistant to Globodera pallida. Eighty three thousand transplants yielded 57,000 tubers for variety selection purposes. Another 8640 seedlings were transplanted for seedling inoculation with Alternaria, 4000 for the trichome population, 1300 of the G. pallida population, and 9000 of the heat tolerant population. Twenty acres of seedling hills produced 6035 single tuber selections in chipping progenies and 1086 russet and long white whole hill selections.

Early Generation Selections: In addition to the 1086 russet type single hill selections, 700 second year chipping selections were saved. These are being screened for GN resistance. In the third generation, 186 clones resistant to GN have been saved and most of them tested for chip quality. The crosses of Rosa x Q155-3, NY72 x Atlantic, and NY72 x Q155-3 were particularly productive of chipping selections. In the fourth generation, 37 clones were saved. Of these 15 have chipping potential. All of the fifth generation clones have been discarded.

Advanced Selections: One clone, NY83 (B35-81) survives in the cohort of crosses made in 1978. This is from a cross between Atlantic and Neotbr. It has small tuber size, yields less than Katahdin, and is a bit deep eyed. However, it has consistently chipped better from 45° storage than Monona and has better specific gravity. It is very early in maturity and is resistant to GN and scab.

The 1977 cohort of seedlings was very productive. Five clones continue to look promising. NY78 is another midseason tablestock clone. Its yield is equal to Katahdin, but somewhat smaller tuber size and equally low in pickouts. It has been essentially free of internal defects and rated better than Katahdin in tuber and vine appearance. It is resistant to GN, scab, and verticillium wilt. NY79 is an early table stock variety with scab resistance nearly equal to Superior's. It sizes up as early as Superior and produces comparable yield of US #1 tubers. It has fewer pickouts and internal defects than Superior and we have rated it better in appearance. It has low specific gravity. In addition to

scab resistance, it also is resistant to GN. NY80 is another early tablestock variety. NY79 and NY80 are full sibs, both being crosses between a neotbr hybrid and Elba. This clone produces full season yield comparable to Katahdin and early season yields comparable to Superior. Tuber size is less than NY79. It has few pickouts and very few internal defects. The tubers have a very attractive shape and skin texture. It is resistant to GN and wart, but susceptible to scab and verticillium wilt. It has low specific gravity and vigorous, attractive vines. NY81 is the most exciting clone in this group. It is a late season tablestock variety with potential for chipping from the field and 50° storage. Its yield has been outstanding. In 17 trials in NY over four years, NY81 has produced 26% more US #1 yield than Katahdin and in three trials in the South, it has produced 12% more than Atlantic. It has large tuber size so the yields of potatoes larger than 2-1/2" are even greater than the checks. Pickouts, primarily growth cracks, are slightly more than Katahdin, but internal defects are very low. We rate tuber and vine appearance better than Katahdin. The specific gravity averages .007 units better than Katahdin, which places it between Norchip and Atlantic. It is resistant to GN and scab. NY82 is a midseason chipping variety. It has a pink splash about the eyes. Its yields on upstate and upland soils are comparable to Katahdin and Superior. It has not done as well on Long Island or on the upstate muck soils. Pickouts and internal defects are low. Specific gravity is similar to Katahdin. It appears to chip as well as Norchip from 50° and close to Monona from 45°. It is resistant to GN and scab.

Two clones have survived from the 1976 crosses. NY76 is a variety with consideration as a midseason chip and tablestock variety. This clone has produced US #1 yields similar to Katahdin, but tuber size is appreciably less than Katahdin. Except for its bright chip color from 50° storage, freedom from pickouts and internal defects, and resistance to GN, it probably would have been discarded for its low specific gravity and susceptibility to scab. NY77 is a midseason tablestock clone with yields, tuber size, percent pickouts, internal defects, and appearance at least as good as that of Katahdin. It has a very attractive vine type and is resistant to GN, scab, and wart.

Two clones from the 1975 crosses appear very promising. NY71 is a mid to late season clone which has produced very good chip color from 45° and 50° storage (Table 1). The upstate yields, pickouts, internal defects, appearance, specific gravity, maturity, and tuber dormancy are all comparable to Katahdin. It is resistant to the golden nematode and has some resistance to scab and verticillium wilt. NY72 (Table 2) has potential for both tablestock and chip production. It has produced 22% more US #1 yields of potatoes than Katahdin in 27 trials in 1980. It performs well on Long Island, upstate N.Y. upland and muck, and in Florida and the East Coast. The tuber size distribution is quite

uniform, comparable to Katahdin with fewer oversize tubers. It has few pickouts or internal defects. The specific gravity is similar to Norchip. Our experience is that it chips as well as Norchip from 50°, but most years not as good as Monona from 45° storage. While the vine maturity is later than Katahdin, it has presented no harvest problems in plots or in farm scale demonstrations. The tubers have an exceptionally long dormancy. In addition to being resistant to the golden nematode, it has excellent resistance to scab and verticillium wilt and a degree of resistance, or lack of susceptibility, to late and early blight.

One of the clones produced in 1972, NY64, is still under trial evaluation, but the fate of this clone is now in the hands of the seed growers in N.Y. This is a mid to late season tablestock variety. Its yields are comparable to Katahdin, but the tuber size is smaller. It has a very bright white skin and fair scab resistance, but is subject to growth cracks. It has few internal defects and is resistant to the golden nematode, but susceptible to verticillium wilt.

US #1 Yield as Percent of Standards (no. of trials)

| <u>Location</u> | <u>Standards</u> | | |
|----------------------|------------------|-----------------|-----------------|
| | <u>Kathadin</u> | <u>Superior</u> | <u>Atlantic</u> |
| Ithaca and Freeville | 91% (6) | 111% (3) | |
| Savannah and Elba | 96% (5) | | |
| Wyoming and Steuben | 119% (4) | | 101% (2) |
| Northern NY | 118% (2) | | |
| Florida and E. Coast | | | 92% (4) |
| Western U.S. | | | 102% (2) |

Agtron Scores for Chip Samples 1982-1985

| | 50° | 45° to 60° | <u>Field Chip</u> | |
|----------|-------------------------------------|-------------------------------------|--------------------------------|-----------------------------------|
| | <u>Storage</u> <u>(8 Trials)</u> | <u>Storage</u> <u>(8 Trials)</u> | <u>NY</u> <u>(3 Trials)</u> | <u>South</u> <u>(3 Trials)</u> |
| NY71 | 55 | 54 | 70 | 70 |
| Monona | 53 | 54 | 65 | |
| Norchip | 53 | | | |
| Atlantic | | | | 65 |

Additional Data From 1980-1985 (no. of observations)

| | <u>NY71</u> | <u>Katahdin</u> | <u>Superior</u> |
|------------------------|-------------|-----------------|-----------------|
| Percent Pickout (19) | 3% | 4% | |
| (8) | 4% | | 3% |
| Internal defects | | | |
| Hollow heart (22) | 2% | 5% | |
| Internal necrosis (22) | 1% | 3% | |

Specific gravity difference from Katahdin (18) = +.002

Appearance score relative to Katahdin (18) = 98%

Vine maturity: similar to Katahdin

Vine vigor: stronger than Katahdin, but same size

Tuber dormancy: 2 weeks later than Katahdin at room temperature

Disease reactions:

Golden nematode: resistant
 Scab: midway between Superior and Katahdin
 Verticillium wilt: between Katahdin and Kennebec
 Late blight: like Katahdin
 Early blight: like Katahdin
 Wart: susceptible

New York Table 2. Summary for NY72 = M297-17 x Bulk GN⁺

US #1 as % of Standard (no. of trials)

| Location | Standards | |
|----------------------|-----------|----------|
| | Katahdin | Atlantic |
| Ithaca and Freeville | 113% (8) | |
| Savannah and Elba | 120% (5) | |
| Wyoming and Steuben | 145% (4) | 124% (2) |
| Northern NY | 101% (2) | |
| Long Island | 133% (12) | |
| Florida and E. Coast | | 118% (3) |

Scores for Chip Samples

| | Agtron | | PCFSA Score | |
|----------|-------------------|--------------------------|---------------------|------------|
| | 50° (5 Trials) | 45° to 60° (4 Trials) | Field (2 Trials) | (3 Trials) |
| NY72 | 55 | 47 | 2.8 | 2.5 |
| Norchip | 54 | | 3.0 | |
| Monona | 55 | 53 | | |
| Atlantic | | | | 2.2 |

Additional Data From 1981-1985 (no. of observations)

| | NY72 | Katahdin |
|-----------------------|------|----------|
| Percent pickout (24) | 4% | 4% |
| Internal defects (32) | | |
| Hollow heart | 1% | 5% |
| Internal necrosis | 1% | 3% |

Specific gravity difference from Katahdin (23) = +.006

Appearance score relative to Katahdin (25) = 105%

Vine maturity: later than Katahdin

Early tuber sizing: like Katahdin

Vine vigor: greater than Katahdin

Tuber dormancy: 6 weeks later than Katahdin at room temperature

Disease reactions:

Golden nematode: resistant

Scab: resistance near Superior

Verticillium wilt: more resistant than Katahdin

Late blight: more resistant than Katahdin

Early blight: more resistant than Katahdin

Wart: susceptible

NORTH CAROLINA

F. L. Haynes

Breeding Program

Advanced trials of selections from North Carolina, other states and the USDA programs were conducted at four coastal locations. Results of three of these are presented in North Carolina Tables 1, 2, and 3. The fourth location, the Tidewater Research Station at Plymouth, contained both an advanced trial and a larger primary trial of new selections. At this location, rainfall between planting and harvest totaled 2.25 inches, thus yields of size A tubers were very low. Total yields were less than one-half normal. Results of these trials are not presented. In the advanced trials, several early and medium early maturing clones produced superior yields and acceptable chip color. The new variety Sunrise produced outstanding yields.

Hybridization, clonal maintenance and seed increase were conducted at two mountain locations. Tetraploid crosses using the cut stem technique produced 26 segregating families for evaluation. A variety trial was also conducted at one mountain location. The results are presented in North Carolina Table 4.

Adaptation and Diploid Breeding

Evaluation of the adapted diploid PHU-STN population was continued at the Fletcher Station. In addition to clonal maintenance and increase of 370 clones, 660 new segregates from seedling populations were selected for evaluation. An isolated seed nursery for random interbreeding was planted for the high dry matter sub-population. An abundant seed supply was harvested.

A study was conducted to evaluate the recurrent selection procedure for maintaining a population and increasing dry matter content. Seventy-two seedling families from an interbreeding, random mating population were compared to their 72 female parent clones for performance. Results indicate this procedure is a progressive way to maintain and increase tuber dry matter and that mild selection pressure for tuber size and appearance may be applied without loss of dry matter. These results are being prepared for publication.

Studies of resistance to early blight were continued. Segregating tetraploid families from commercial 4X x early blight resistant 2X crosses were evaluated in inoculated plantings. Seventy-seven 4X clones exhibited high levels of resistance uniformly across all three replications. Heritability of early blight resistance in 4X progeny of 4X-2X crosses has been determined. Heritability is very high and not significantly different from the estimates determined in studies of 2X-2X crosses. These results are being prepared for publication.

The study of resistance to tuber soft rot and blackleg was continued and field resistance to both diseases was confirmed. Seed tubers were inoculated with strains of E. carotovora, subsp. atroseptica and E. carotovora subsp. carotovora and planted on June 7, 1985 at Fletcher. The cultivar Superior was used as the control. Diploid clones with high levels of resistance and producing unreduced gametes are being crossed to commercial tetraploids to produce 4X progeny.

The 4X-2X hybrid program is continuing. The crosses involving high dry matter diploids have been very promising. Tetraploid hybrids from both the high dry matter and early blight resistance studies are being used in backcrosses to commercial tetraploids.

North Carolina Table 1. Potato trial at Bright Farm, Pasquotank County. Plots were 1 row, 24 ft. long, 4 replications of 24 entries in RCB, 32 hills/plot. Spacing in rows, 9 inches, 40 inch rows. Fertilized 2100 lb./A 10-10-10 banded. Planted 3/15/85, harvested 6/24/85 (100 days).

| Variety | US#1-A CWT./A | Appearance ^{1/} | Chip ^{2/} Color | Specific Gravity | Maturity |
|------------|------------------|--------------------------|-----------------------------|---------------------|------------|
| Sunrise | 330.1 | 7.5 | 3.3 | 1.068 | Med. early |
| 76C29-7 | 310.4 | 8.0 | 4.8 | 1.066 | Med. early |
| ND860-2 | 307.6 | 7.7 | 2.8 | 1.071 | Early |
| NY71 | 296.8 | 7.0 | 3.8 | 1.067 | Midseason |
| 80C45-10 | 294.0 | 8.2 | 4.3 | 1.067 | Midseason |
| NY81 | 292.0 | 8.5 | 5.0 | 1.072 | Med. early |
| NY82 | 291.3 | 8.0 | 2.5 | 1.069 | Midseason |
| NY79 | 289.3 | 7.0 | 3.3 | 1.068 | Midseason |
| NY74 | 281.1 | 8.0 | 3.0 | 1.083 | Med. early |
| Pungo | 276.3 | 7.0 | 5.5 | 1.068 | Midseason |
| Atlantic | 272.9 | 7.0 | 4.3 | 1.078 | Midseason |
| 73C26-1 | 272.9 | 8.0 | 4.3 | 1.078 | Med. early |
| M704-10 | 267.5 | 8.0 | 3.8 | 1.075 | Med. early |
| B9384-4 | 262.0 | 7.7 | 2.3 | 1.072 | Med. early |
| B9340-13 | 261.4 | 8.0 | 3.5 | 1.077 | Med. early |
| NY76 | 257.3 | 6.7 | 3.3 | 1.061 | Midseason |
| 80C40-15 | 253.9 | 7.5 | 4.0 | 1.068 | Med. early |
| Superior | 250.5 | 8.0 | 3.3 | 1.071 | Early |
| Islander | 248.4 | 7.2 | 3.8 | 1.069 | Midseason |
| NY75 | 244.3 | 7.0 | 3.8 | 1.078 | Med. early |
| Norchip | 239.6 | 6.7 | 3.5 | 1.071 | Med. early |
| 80C42-3 | 236.0 | 7.7 | 4.5 | 1.072 | Med. early |
| Nemarus | 230.1 | 8.0 | 3.8 | 1.064 | Med. early |
| Y. Chipper | 219.8 | 7.5 | 3.0 | 1.076 | Med. early |
| LSD (.05) | 49.3 | 0.5 | | | |
| CV (PCT) | 12.9 | | | | |

^{1/}Appearance: 1 = Very Poor; 3 = Poor; 5 = Fair; 7 = Good; 9 = Excellent.

^{2/}Chip color determined by Wise Foods, Borden, Inc., Berwick, PA. 1-4 acceptable with grade 1 = perfect; 5 useable but not desirable; 6-14 unacceptable with 14 = black.

North Carolina Table 2. Potato Trial at Cooper Farm, Tyrrell County. Plots were 1 row, 24 ft. long, 4 replications of 24 entries in RCB, 32 hills/plot. Spacing in row, 9 inches. Width row, 38 inches. Fertilized 210 lbs. N, 120 lbs P₂O₅, 120 lbs. K₂O/A. Planted 3/14/85, harvested 6/26/85 (103 days).

| Variety | US#1-A CWT./A | Appearance ^{1/} | Chip ^{2/} Color | Specific Gravity | Maturity |
|------------|------------------|--------------------------|-----------------------------|---------------------|------------|
| Sunrise | 390.5 | 8.0 | 3.8 | 1.075 | Med. early |
| B9792-132 | 389.1 | 7.0 | 3.0 | 1.076 | Midseason |
| B9423-4 | 383.3 | 7.2 | 2.5 | 1.073 | Med. early |
| 80C45-10 | 370.4 | 8.0 | 4.3 | 1.070 | Midseason |
| B9384-4 | 368.3 | 7.2 | 2.5 | 1.073 | Med. early |
| 76C29-7 | 367.6 | 7.0 | 3.5 | 1.071 | Midseason |
| Atlantic | 366.8 | 7.5 | 4.3 | 1.084 | Midseason |
| Norchip | 359.7 | 7.0 | 2.8 | 1.078 | Med. Early |
| Pungo | 352.5 | 7.0 | 5.8 | 1.072 | Midseason |
| B9792-149 | 347.5 | 7.0 | 3.8 | 1.080 | Midseason |
| B9340-13 | 337.5 | 7.7 | 3.1 | 1.076 | Med. early |
| Islander | 328.9 | 7.7 | 3.3 | 1.076 | Med. early |
| Superior | 326.7 | 8.0 | 4.0 | 1.075 | Early |
| Nemarus | 319.6 | 8.0 | 3.8 | 1.074 | Midseason |
| B9792-196 | 311.0 | 7.7 | 2.5 | 1.083 | Med. early |
| B9792-69 | 305.9 | 7.2 | 3.0 | 1.079 | Midseason |
| 73C26-1 | 300.2 | 8.5 | 3.8 | 1.073 | Med. early |
| B9792-136 | 281.6 | 8.0 | 2.3 | 1.075 | Midseason |
| Y. Chipper | 276.6 | 8.0 | 2.5 | 1.077 | Early |
| 80C43-4 | 266.5 | 8.0 | 5.0 | 1.070 | Med. early |
| 80C40-15 | 255.8 | 7.5 | 4.0 | 1.069 | Med. early |
| 79C44-2 | 252.2 | 7.5 | 6.3 | 1.070 | Med. early |
| 80C40-3 | 215.7 | 8.2 | 4.5 | 1.072 | Med. early |
| 80C42-3 | 215.0 | 8.0 | 4.0 | 1.072 | Early |
| LSD (.05) | 48.0 | 0.5 | | | |
| C.V. (PCT) | 10.6 | | | | |

^{1/}Appearance: 1 = Very Poor; 3 = Poor; 5 = Fair; 7 = Good; 9 = Excellent.

^{2/}Chip color determined by Wise Foods, Borden, Inc., Berwick, PA. 1-4 acceptable with grade 1 = perfect; 5 useable but not desirable; 6-14 unacceptable with 14 = black.

North Carolina Table 3. Potato trial at Davis Farm, Tyrrell County. Plots were 1 row, 24 ft. long, 4 replications of 24 entries in RCB, 32 hills/plot. Spacing in row, 9 inches. Width row, 38 inches. Fertilized 1500 lbs./A 15-10-10. Planted 3/14/85, harvested 6/25/85 (102 days).

| Variety | US#1-A CWT./A | Appearance ^{1/} | Chip ^{2/} Color | Specific Gravity | Maturity |
|------------|------------------|--------------------------|-----------------------------|---------------------|------------|
| NY81 | 419.2 | 8.2 | 5.5 | 1.066 | Med. early |
| NY74 | 404.1 | 8.5 | 2.8 | 1.081 | Med. early |
| 76C29-7 | 402.7 | 7.0 | 5.0 | 1.060 | Midseason |
| NY82 | 386.2 | 8.0 | 2.5 | 1.063 | Midseason |
| Superior | 351.8 | 8.0 | 3.5 | 1.066 | Early |
| NY71 | 343.2 | 7.2 | 3.3 | 1.064 | Midseason |
| Atlantic | 338.2 | 7.5 | 4.5 | 1.078 | Midseason |
| 73C26-1 | 326.0 | 8.0 | 4.0 | 1.068 | Med. early |
| Nemarus | 321.0 | 8.0 | 4.5 | 1.067 | Midseason |
| NY76 | 318.1 | 7.2 | 3.5 | 1.062 | Med. early |
| Sunrise | 313.8 | 8.0 | 3.5 | 1.060 | Med. early |
| NY79 | 311.0 | 7.5 | 3.3 | 1.062 | Midseason |
| Norchip | 303.8 | 7.2 | 3.5 | 1.067 | Med. early |
| 80C40-3 | 296.6 | 7.0 | 5.8 | 1.061 | Midseason |
| 80C40-15 | 296.0 | 7.5 | 4.0 | 1.066 | Med. early |
| 80C43-4 | 295.9 | 7.0 | 6.0 | 1.068 | Med. early |
| Y. Chipper | 290.2 | 8.2 | 4.0 | 1.070 | Early |
| NY75 | 283.7 | 7.5 | 2.5 | 1.078 | Med. early |
| Islander | 278.7 | 8.2 | 4.5 | 1.067 | Med. early |
| B9384-4 | 278.6 | 7.7 | 2.3 | 1.068 | Med. early |
| Pungo | 270.8 | 7.0 | 5.8 | 1.060 | Midseason |
| 80C38-30 | 261.5 | 8.0 | 4.0 | 1.071 | Midseason |
| B9340-13 | 253.6 | 8.0 | 4.8 | 1.072 | Med. early |
| 79C33-4 | 232.9 | 8.5 | 5.3 | 1.069 | Early |
| LSD (.05) | 55.7 | 0.6 | | | |
| C.V. (PCT) | 12.1 | | | | |

^{1/}Appearance: 1 = Very Poor; 3 = Poor; 5 = Fair; 7 = Good; 9 = Excellent.

^{2/}Chip color determined by Wise Foods, Borden, Inc., Berwick, PA. 1-4 acceptable with grade 1 = perfect; 5 useable but not desirable; 6-14 unacceptable with 14 = black.

North Carolina Table 4. Potato trial at Mountain Horticultural Crops Research Station, Fletcher, NC. Plots were 1 row, 24 ft. long, 4 replications of 16 entries in RCB, 32 hills/plot. Spacing in row, 9 inches. Width row, 42 inches. Fertilized 110 lbs. N, 110 lbs P_2O_5 , 60 lbs. K_2O/A , banded. Planted 4/22/85, harvested 8/7/85 (107 days).

| Variety | US#1-A Cwt./A | Percent 1-A | Percent 1-B | Appearance ^{1/} | Maturity |
|-------------|------------------|----------------|----------------|--------------------------|------------|
| Pungo | 482.9 | 95.3 | 1.4 | 6.2 | Midseason |
| Belchip | 449.9 | 93.7 | 1.1 | 6.7 | Med. late |
| Kennebec | 429.1 | 91.7 | 2.1 | 6.2 | Late |
| 73C26-1 | 426.5 | 95.1 | 2.3 | 8.0 | Med. early |
| Islander | 424.0 | 94.4 | 4.1 | 8.2 | Med. early |
| Atlantic | 417.5 | 97.4 | 1.0 | 8.0 | Midseason |
| Norchip | 410.3 | 75.4 | 23.1 | 7.5 | Med. early |
| Superior | 407.1 | 96.2 | 1.6 | 7.2 | Early |
| Wauseon | 400.6 | 96.7 | 1.6 | 7.5 | Med. early |
| Sunrise | 393.5 | 93.1 | 2.1 | 8.0 | Med. early |
| B9384-4 | 390.9 | 95.5 | 4.2 | 8.2 | Early |
| Campbell 13 | 373.4 | 93.2 | 2.5 | 7.2 | Med. early |
| Y. Supreme | 364.3 | 93.4 | 2.5 | 8.0 | Midseason |
| Y. Chipper | 348.1 | 91.0 | 8.0 | 8.0 | Med. early |
| B9340-13 | 342.9 | 94.4 | 3.3 | 8.2 | Med. early |
| Namarus | 317.6 | 93.6 | 4.2 | 8.0 | Midseason |
| LSD (.05) | 64.1 | 13.8 | 13.7 | 0.6 | |
| C.V. (PCT) | 11.3 | | | | |

^{1/}Appearance: 1 = Very Poor; 3 = Poor; 5 = Fair; 7 = Good; 9 = Excellent.

NORTH DAKOTA

R. H. Johansen, B. Farnsworth, A. Thompson, D. C. Nelson,
G. Secor, P. Nolte and N. C. Gudmestad

Crossing and Seedling Production: During the winter and spring of 1985, 424 potato crosses were made in the greenhouse. For seedling production, 60,465 potato seedlings were planted in the greenhouse during the summer and 45,161 seedlings were planted in the field at the Langdon Experiment Station in 1985. From the seedlings planted, 1,350 were saved in the fall for further evaluation and increase. The seedlings were planted at Langdon on May 7 and 8 and harvested on September 9, 10 and 11th.

Advanced Selections: At Grand Forks and Absaraka, 834 second year selections were grown and at harvest 254 were saved for further increase and testing. At Grand Forks and Casselton, 323 third and fourth year selections were grown and 163 were saved at harvest. Several hundred selections and cultivars from Texas, Idaho and other states were also included in the trial during 1985. The Grand Forks plot was planted on May 21 and harvested on September 4th and 5th. The Casselton plot was planted on May 20 and harvested on September 18th. An increase plot was also again planted at Barnesville; however, rains in May and June almost destroyed all of the plot.

Promising Selections: On March 1, the selection ND388-1Russ was named NorKing Russet. This cultivar continues to look promising in several areas and it is anticipated that its major use will be for both frozen french fries and fresh use. A fairly large acreage of ND534-4Russ and ND860-2 were planted in 1985. In North Dakota, 82 acres of ND860-2 were planted for regular certification and 18 acres for basic seed. As for ND534-4Russ, 93 acres were planted for regular certification and 35 acres for basic seed. An excellent chipping selection, ND860-2, chips out of 38° F (3.4° C) while ND534-4Russ is a beautiful appearing russet that should be well adapted for both fresh and frozen french fry use.

Other selections that are being increased by growers in Beach and the Red River Valley are ND651-9, ND1215-1, ND398-1, NDT9-1068-11R and ND1196-2R. These selections will again be grown in trial at Homestead, Florida this winter and in other trials next summer. Two excellent looking red selections are NDT9-1068-11R and ND1196-2R while the whites are good chippers. NDT9-1068-11R is a ND seedling selected in Texas by Dr. Creighton Miller.

Cultivar & Selection Trials: Potato variety trials were again planted at Park River, Grand Forks, Minot, Karlsruhe and Williston (ND Table 1). The trials consisted of 25 hills grown in four replicated blocks. There were 25 entries grown

at Grand Forks and Park River (ND Table 2), while 11 were grown at Minot and Williston and seven at Karlsruhe (ND Table 3). General maintenance of the trials was under the supervision of Wayne Grinde at Park River and Duane Preston at Grand Forks. The trials at Williston, Minot and Karlsruhe were handled by the Station Superintendents and their assistants.

The North Central Trial consisting of 23 entries was again planted at Grand Forks, North Dakota. Data on this trial will be in a separate report. A selection and cultivar screening trial was also planted at Grand Forks (ND Table 4). This trial consists of new selections that have the potential to be entered in the state under trials the following year. This trial is smaller, having only 20 hills and three replications.

In the Red River Valley, the season was generally cool with ample moisture. Grand Forks reported approximately nine inches of rain during the growing season. Because of late rains, quite a lot of hollow heart was observed at Grand Forks. At Minot, temperatures were much below normal in June and August, slightly below in July and above normal in May. Rainfall at Minot was 12.3 inches, which was 2.8 inches above normal. At Williston, rainfall and temperatures were below normal in May and June, with August and September being wet and cool. At Karlsruhe, it was also cool during the growing season. This location received 10.5 inches of irrigation water.

In the Red River Valley, Park River produced the highest yield. The average yield at Grand Forks was 182 cwt per acre, while Park River had an average of 230 cwt per acre. Yields were very high at Minot and very low at Williston. Minot had about the highest yields ever recorded at this station and no doubt the ample moisture and good growing conditions contributed to the high yield.

Of the 25 entries in the Red River Valley trials, Red Pontiac again produced the highest yield; however, the North Dakota Texas selection NDT9-1068-11R was very similar to Red Pontiac in yield. This selection has much better red color and is smoother than Red Pontiac. Other high yielding entries were ND1215-1, Kennebec and ND651-9. Super Norgold Russet out-yielded regular Norgold Russet while NorKing Russet was similar to Norgold Russet in yield. The highest yielding russet, however, was ND671-4Russ. All of the russet selections out-yielded the old standard, Russet Burbank. With its beautiful tuber type and russetting, ND534-4Russ looked exceptionally

good in trial. Line ND860-2, with a better seed source this year, was quite comparable to Norchip in yield. Line ND860-2, TND22-2, ND398-1, NorKing Russet and Russet Burbank had total solids of 22.0 percent or higher when grown in the Red River Valley trials.

In the advanced selection and cultivar trial, ND1562-4R and ND1871-3R were the highest yielding entries. The Russet Burbank clones were generally the lowest yielding entries in trial; however, most of them are late maturing. If they were allowed to grow a few weeks longer, their yield, no doubt, would have been higher. A new russet selection from Idaho, A74114-4, looked good in trial. Other North Dakota selections that look promising are ND 1215-16 and ND1960-1Russ.

Processing Tests - Chipping: Chip tests from selection and cultivars grown in the 1985 potato cultivar trials are found in ND Table 5. Potato samples were stored for approximately four months at 38° F and then chipped. After that, samples were stored at 60° F and chipped after two and four weeks reconditioning. Percent chip yield and Agtron readings were taken on all samples. Line ND860-2 again chipped fairly well out of 38° F (3.3° C) and continued to improve somewhat after reconditioning. This selection has S. phureja in its pedigree. Other outstanding chippers were ND55-7, ND651-9, ND1215-1 and ND1323-1. NorKing Russet had Agtron readings much above Russet Burbank and Norgold Russet. Percent chip yield was high for most entries in trial. There were 215 second year selections tested for chip quality by the processing laboratory at East Grand Forks. These samples were placed in cold storage and then reconditioned at 60° F before being chipped. Of the second year selections, 80 had Agtron readings of 40 or above. The third and fourth year selections were chipped out of 43° F and after being reconditioned for several weeks at 60° F. There were 78 third and fourth year selections tested and nine had Agtron readings above 40 after being reconditioned.

Processing Tests - French Fries: The Food and Nutrition Department at NDSU tested 14 selections and five cultivars for french fry quality (ND Table 6). Samples were scored for color, texture and flavor. For overall color, several selections were better than Russet Burbank. NorKing Russet seemed to be better in overall quality than the check variety, Russet Burbank, while ND534-4Russ seems to be quite comparable. Another promising russet selection, ND671-4Russ, scored high in french fry quality.

Culinary Tests: There were 24 selections and cultivars tested for boiling and baking after being grown in the Park River and Grand Forks potato variety trial (ND Table 7). NorKing Russet and ND534-4Russ were found to be excellent for both boiling and baking. In the baking test, NorKing Russet was one of the highest in overall mealiness.

Disease Control and Resistance Studies: Approximately 1600 second year and older breeding selections were evaluated for disease and resistance to scab and silver scurf at the Potato Research Farm, Grand Forks. There were 834 second year selections grown in an isolated area (Absaraka) and evaluated for disease and horticultural characters. There were 292 advanced selections grown in an isolated area (Casselton) and evaluated for disease and disease reactions. Selections from these two areas (202 for parents, 288 for maintenance, 39 superior selections for basic seed increase) were glasshouse grown and visually indexed for tuber-borne diseases. These selections were also indexed for PVX and PVY using serology (ELISA) and spindle tuber viroid using dot-blot hybridization tests. Representative "B" size tubers of these selections were also grown in Florida during the winter for disease indexing, particularly for virus diseases. Based on all indexing tests, the following numbers of virus infected plants were found: PSTV 20, PVX 0, PVY 3, leafroll 10, mosaic 3. The disease free selections are maintained as a source of clean seed for breeding and other purposes. There were 39 second year selections indexed for disease and 36 were released to growers in Beach, North Dakota as part of the basic seedstock program. The selections sent to Beach in 1985 were 1215-1, 1215-16, 1725-4, 1842-1Russ, 2003-1R, 2008-2, 2012-7, 2013-4, 2013-11, 2016-7, 2019-1Russ, 2021-4Russ, 2031-8, 2047-2Russ, 2047-12Russ, 2047-13Russ, 2050-1R, 2055-7, 2080-6R, 2083-13, 2106-1, 2109-2, 2126-7, 2129-3, 2135-3Russ, 2139-7R, 2141-4Russ, 2164-10, 2168-5Russ, 2173-11R, 2203-1, 2207-8Russ, 2222-7, 2224-5R, 2233-2Russ, 2249-5Russ. There were 33 advanced selections and 15 species tested for resistance to verticillium using a detached leaf assay. Selections showing resistance were: 372-2R, NorKing Russet, 678-8, 671-4Russ, 1118-1, 1215-1, 1215-16, 1452-1, 1562-4R, 1696-8, 1730-10, 1859-3. Susceptible selections include 534-4Russ and 860-2. Of the species tested, only phureja showed resistance.

There were 21 advanced selections evaluated for bacterial ring rot (BRR) disease reactions. There were 24 seed pieces per selection inoculated with suspensions of the ring rot bacterium and planted in the field (Prosper). Foliar and tuber symptoms of BRR were evaluated periodically during the

growing season. Typical foliar symptoms of BRR were displayed 79 days after planting by the following selections: 698-1, 860-2, 967-1Russ, 1098-3Russ, 1113-10Russ, 1118-1, 1196-2R, 1245-1Russ and 1323-1. Typical foliar symptoms of BRR were displayed 90 days after planting by the following selections: 372-2R, 534-4Russ, 651-9, 671-4Russ, 944-6, 1183-2, 1215-1 and AT97259B-8Russ. Mild foliar symptoms of BRR were noted on: NorKing, 649-4R, 678-8, 971-5Russ, and T-7-294-1Russ. These selections will be tested again in 1986. All selections tested displayed typical tuber symptoms of periderm cracking and internal vascular discoloration.

North Dakota Table 1. Spacing, Fertilizer, Soil Type, Planting and Harvest Dates
of the 1985 Trial.

| Location | <u>Spacing</u> | | Fertilizer | Soil Types | Planting | | Harvest |
|-------------|----------------|----------------|---------------------------|---------------------|----------|-------|---------|
| | Row (in.) | Plant (in.) | | | Date | Date | |
| Park River | 38 | 12 | Fall application | Glyndon Silt Loam | 5/6 | 9/6 | |
| Grand Forks | 38 | 12 | 22-22-12 | Bearden Clay Loam | 5/20 | 9/26 | |
| | | | 300 lbs./acre | | | | |
| Williston | 36 | 16 | None | Loam | 5/17 | 10/23 | |
| Minot | 36 | 14 | 90-0-0 | Williams Loam | 5/6 | 9/30 | |
| | | | 350 lbs./acre | | | | |
| Karlsruhe | 36 | 14 | 78-45-45 250 lbs./acre | Clontarf Sandy Loam | 5/7 | 10/1 | |

North Dakota Table 2. US No. 1 yield, per cent US No. 1 and per cent total solids of potato cultivars and selections grown in the Red River Valley, 1985.

| Cultivar or Selection | Grand Forks | | | | Park River | | | | Average | | | |
|-----------------------|----------------|----------|--------------|---|----------------|----------|--------------|---|----------------|----------|--------------|---|
| | Cwt/A | | % | | Cwt/A | | % | | Cwt/A | | % | |
| | US No. 1 Yield | US No. 1 | Total Solids | % | US No. 1 Yield | US No. 1 | Total Solids | % | US No. 1 Yield | US No. 1 | Total Solids | % |
| Red Pontiac | 296 | 86 | 19.2 | | 335 | 86 | 19.2 | | 316 | 86 | 19.2 | |
| NDT9-1068-11R | 239 | 89 | 19.2 | | 336 | 94 | 19.2 | | 288 | 92 | 19.2 | |
| ND1215-1 | 226 | 87 | 19.9 | | 309 | 89 | 19.7 | | 268 | 88 | 19.8 | |
| Kennebec | 177 | 68 | 19.2 | | 321 | 92 | 20.9 | | 249 | 80 | 20.1 | |
| ND651-9 | 199 | 87 | 21.4 | | 284 | 85 | 20.7 | | 242 | 86 | 21.1 | |
| TND22-2 | 209 | 84 | 23.3 | | 243 | 89 | 22.9 | | 226 | 87 | 23.1 | |
| ND671-4Russ | 204 | 83 | 20.7 | | 243 | 89 | 21.2 | | 223 | 86 | 20.9 | |
| Redsen | 216 | 86 | 19.9 | | 227 | 84 | 20.5 | | 222 | 85 | 20.2 | |
| AT9-77259B8Russ | 215 | 93 | 21.4 | | 227 | 88 | 22.4 | | 221 | 90 | 21.9 | |
| ND649-4R | 185 | 89 | 21.2 | | 253 | 95 | 20.7 | | 219 | 92 | 20.9 | |
| ND372-2R | 179 | 81 | 21.2 | | 255 | 87 | 21.4 | | 217 | 84 | 21.3 | |
| Super Norgold Russet | 193 | 80 | 20.1 | | 230 | 86 | 21.4 | | 212 | 83 | 20.7 | |
| ND398-1 | 162 | 77 | 22.4 | | 255 | 86 | 21.6 | | 209 | 81 | 22.0 | |
| ND1196-2R | 223 | 90 | 19.0 | | 181 | 83 | 18.4 | | 202 | 87 | 18.7 | |
| Red Norland | 188 | 91 | 18.8 | | 210 | 87 | 20.1 | | 199 | 89 | 19.4 | |
| Norgold Russet | 181 | 81 | 19.9 | | 216 | 82 | 21.4 | | 199 | 81 | 20.7 | |
| NorKing Russet | 191 | 85 | 21.8 | | 187 | 79 | 22.2 | | 189 | 82 | 22.0 | |
| ND1113-10Russ | 199 | 85 | 19.7 | | 178 | 77 | 21.4 | | 189 | 81 | 20.5 | |
| Norchip | 175 | 80 | 22.2 | | 199 | 78 | 21.6 | | 187 | 79 | 21.9 | |
| ND791-5R | 189 | 79 | 19.2 | | 181 | 78 | 18.8 | | 185 | 78 | 19.0 | |
| ND860-2 | 168 | 84 | 22.2 | | 192 | 82 | 22.2 | | 180 | 83 | 22.2 | |
| ND534-4Russ | 161 | 78 | 20.1 | | 193 | 88 | 20.3 | | 177 | 83 | 20.2 | |
| ND1323-1 | 152 | 77 | 18.6 | | 173 | 82 | 20.3 | | 162 | 80 | 19.4 | |
| ND1118-1 | 168 | 79 | 19.9 | | 149 | 72 | 20.1 | | 159 | 75 | 20.0 | |
| Russet Burbank | 144 | 69 | 22.2 | | 161 | 60 | 21.8 | | 152 | 65 | 22.0 | |
| Average | 182 | 83 | 20.5 | | 230 | 84 | 20.8 | | 211 | 84 | 20.7 | |

North Dakota Table 3. Yield Data and Total Solids of Potato Cultivars Grown at Minot, Williston and Karlsruhe, ND - 1985^{1/}

| | MINOT | | | WILLISTON | | |
|----------------|----------------|-------------|-----------------|----------------|-------------|-----------------|
| | Cwt/A | Percent | Percent | Cwt/A | Percent | Percent |
| | US | | | US | | |
| | No. 1 Yield | US No. 1 | Total Solids | No. 1 Yield | US No. 1 | Total Solids |
| Kennebec | 412 | 96 | 22.7 | 169 | 97 | 18.2 |
| Norchip | 241 | 94 | 24.2 | 106 | 85 | 20.9 |
| Norgold Russet | 277 | 93 | 22.2 | 54 | 76 | 21.8 |
| NorKing Russet | 249 | 87 | 23.3 | 82 | 78 | 22.4 |
| Red Norland | 256 | 98 | 20.5 | 84 | 93 | 20.1 |
| Red Pontiac | 300 | 98 | 20.7 | 117 | 93 | 17.7 |
| Redsen | 213 | 91 | 20.3 | 24 | 69 | 19.9 |
| Russet Burbank | 234 | 74 | 24.6 | 124 | 81 | 18.2 |
| ND534-4Russ | 252 | 90 | 21.6 | 33 | 60 | 21.2 |
| ND651-9 | 262 | 93 | 22.9 | 90 | 82 | 21.8 |
| ND860-2 | 208 | 87 | 22.7 | 26 | 61 | 21.2 |
| Average | 264 | 91 | 22.3 | 83 | 80 | 20.3 |

| | KARLSRUHE | | |
|----------------|----------------|-------------|-----------------|
| | Cwt/A | Percent | Percent |
| | US | | |
| | No. 1 Yield | US No. 1 | Total Solids |
| Norgold Russet | 234 | 92 | 21.2 |
| Norland | 227 | 95 | 19.4 |
| NorKing Russet | 237 | 89 | 22.9 |
| Redsen | 251 | 92 | 20.1 |
| Norchip | 251 | 93 | 23.1 |
| Red Pontiac | 349 | 97 | 20.9 |
| ND671-4Russ | 235 | 81 | 20.5 |
| Average | 255 | 91 | 21.2 |

1/ Minot and Williston are dry land; Karlsruhe is irrigated.

North Dakota Table 4. Advanced Selection Trial Grown at Grand Forks,
North Dakota - 1985.

| | US No. 1 Yield cwt/A | % US No. 1 | Specific Gravity | % Total Solids |
|----------------|----------------------------|---------------|---------------------|----------------------|
| ND1562-4R | 285 | 88 | 1.073 | 18.2 |
| ND1871-3R | 281 | 89 | 1.084 | 20.5 |
| Redsen | 253 | 85 | 1.077 | 19.0 |
| Red Norland | 234 | 93 | 1.076 | 18.8 |
| Tolaas | 221 | 84 | 1.080 | 19.7 |
| ND1960-1Russ | 221 | 80 | 1.085 | 20.7 |
| ND1859-3 | 204 | 89 | 1.092 | 22.2 |
| ND1892-2R | 194 | 82 | 1.079 | 19.4 |
| ND1715-5R | 183 | 80 | 1.078 | 19.2 |
| ND1215-16 | 179 | 79 | 1.083 | 20.3 |
| ND1520-3Russ | 171 | 90 | 1.065 | 16.5 |
| A74114-4 | 171 | 66 | 1.088 | 21.4 |
| ND1719-5Russ | 156 | 87 | 1.083 | 20.3 |
| Norchip | 141 | 73 | 1.094 | 22.7 |
| ND1696-8 | 140 | 78 | 1.087 | 21.2 |
| ND698-1 | 130 | 80 | 1.087 | 21.2 |
| ND967-1Russ | 129 | 71 | 1.071 | 17.7 |
| RBVH451 | 127 | 59 | 1.090 | 21.8 |
| Norgold Russet | 124 | 71 | 1.073 | 18.2 |
| ND1685-14 | 114 | 75 | 1.085 | 20.7 |
| ND1183-2 | 112 | 78 | 1.096 | 23.1 |
| ND1394-1Russ | 109 | 71 | 1.080 | 19.7 |
| ND1925-4 | 100 | 74 | 1.090 | 21.8 |
| RB B.E.A. | 99 | 50 | 1.086 | 20.9 |
| RB5788 | 88 | 47 | 1.093 | 22.4 |
| RBVL24 | 82 | 44 | 1.088 | 21.4 |
| RB4668 | 52 | 42 | 1.082 | 20.1 |
| Average | 159 | 74 | 1.083 | 20.3 |

North Dakota Table 5. 1985 Chip Tests (Agrtron Reading) of Cultivars and Selections Grown at Park River and Grand Forks in 1984.

| Cultivar or Selection | 0 weeks 38°F | | | 2 weeks 60°F | | | 4 weeks 60°F | | | Percent yield average 3 tests | | |
|--------------------------|----------------|---------------|--|----------------|---------------|--|----------------|---------------|--|----------------------------------|---------------|--|
| | Grand Forks | Park River | | Grand Forks | Park River | | Grand Forks | Park River | | Grand Forks | Park River | |
| | | | | | | | | | | | | |
| Kennebec | 18.5 | 21.0 | | 45.5 | 44.5 | | 42.0 | 47.5 | | 31.4 | 31.0 | |
| Norchip | 23.0 | 25.5 | | 43.5 | 35.5 | | 51.5 | 48.5 | | 33.1 | 33.7 | |
| Norgold Russet | 16.5 | 14.5 | | 22.5 | 22.5 | | 30.0 | 29.0 | | 31.0 | 32.5 | |
| Norking Russet | 17.0 | 25.5 | | 28.0 | 39.5 | | 46.0 | 44.0 | | 32.0 | 32.0 | |
| Russet Burbank | 15.5 | 16.0 | | 23.0 | 37.5 | | 25.0 | 33.0 | | 32.0 | 34.4 | |
| TND22-2 | 21.0 | 26.5 | | 44.0 | 38.5 | | 55.0 | 44.5 | | 34.2 | 34.3 | |
| RE5788 | 20.5 | 21.0 | | 33.5 | 35.0 | | 47.5 | 30.0 | | 34.4 | 35.6 | |
| ND55-7 | 23.0 | 21.5 | | 47.0 | 40.0 | | 56.5 | 51.5 | | 33.7 | 34.0 | |
| ND534-4Russ | 13.0 | 16.0 | | 38.5 | 31.5 | | 43.0 | 33.5 | | 33.0 | 33.0 | |
| ND651-9 | 25.0 | 29.5 | | 51.0 | 50.0 | | 49.0 | 45.0 | | 32.0 | 31.5 | |
| ND678-8 | 20.0 | 22.5 | | 37.0 | 34.0 | | 44.0 | 45.5 | | 32.0 | 32.5 | |
| ND860-2 | 38.0 | 41.5 | | 58.0 | 48.0 | | 49.5 | 48.5 | | 33.0 | 34.0 | |
| ND967-1Russ | 15.5 | 19.0 | | 20.5 | 18.0 | | 24.0 | 22.0 | | 30.0 | 29.8 | |
| ND1118-1 | 24.0 | 23.0 | | 38.0 | 44.5 | | 47.0 | 36.5 | | 29.0 | 30.1 | |
| ND1215-1 | 20.5 | 27.0 | | 36.0 | 42.0 | | 49.0 | 42.5 | | 30.8 | 31.8 | |
| ND1323-1 | 13.0 | 13.0 | | 48.5 | 30.5 | | 48.0 | 46.5 | | 30.0 | 30.0 | |
| ND398-1 | 24.0 | | | 49.0 | | | 50.0 | | | 37.0 | | |
| ND671-4Russ | 19.0 | | | 30.0 | | | 37.0 | | | 30.8 | | |
| ND698-1 | 32.0 | | | 43.0 | | | 52.0 | | | 33.0 | | |
| ND800-4Russ | 21.0 | | | 39.0 | | | 34.0 | | | 30.3 | | |
| ND862-8 | 30.0 | | | 59.0 | | | 57.0 | | | 31.5 | | |
| ND971-5Russ | 10.0 | | | 14.0 | | | 23.0 | | | 33.0 | | |
| ND1065-5 | 28.0 | | | 57.0 | | | 56.0 | | | 34.0 | | |
| ND1098-3Russ | 21.0 | | | 21.0 | | | 36.0 | | | 32.3 | | |
| ND1113-10Russ | 17.0 | | | 33.0 | | | 42.0 | | | 33.5 | | |
| ND1183-2 | 26.0 | | | 41.0 | | | 56.0 | | | 35.0 | | |
| ND1452-12 | 20.0 | | | 29.0 | | | 52.0 | | | 33.3 | | |
| Average | 21.2 | 22.7 | | 38.1 | 37.0 | | 44.5 | 40.5 | | 32.4 | 32.5 | |

North Dakota Table 6. Average Scores for French Fry Tests^{1/}.

| Cultivar or Selection | Color | Texture | Flavor | Average Score | Ranking |
|-----------------------|-------|---------|--------|---------------|---------|
| Kennebec | 7.2 | 6.7 | 6.0 | 6.6 | 8 |
| Russet Burbank | 5.5 | 6.0 | 5.9 | 5.8 | 14 |
| NorKing Russet | 6.8 | 6.8 | 6.8 | 6.8 | 6 |
| Viking | 3.4 | 4.5 | 4.1 | 4.0 | 19 |
| Ore Ida | 6.9 | 6.8 | 7.1 | 6.9 | 5 |
| TND22-2 | 6.9 | 6.7 | 5.0 | 6.2 | 11 |
| ND534-4Russ | 5.6 | 5.6 | 6.2 | 5.8 | 15 |
| ND671-4Russ | 6.1 | 7.0 | 7.0 | 6.7 | 7 |
| ND678-8 | 8.1 | 6.9 | 7.0 | 7.3 | 3 |
| ND967-1Russ | 5.9 | 5.8 | 6.6 | 6.1 | 13 |
| ND1098-3Russ | 5.4 | 5.8 | 5.6 | 5.6 | 16 |
| ND1118-1 | 8.5 | 7.2 | 6.8 | 7.5 | 1 |
| ND1113-10Russ | 6.1 | 6.2 | 6.1 | 6.1 | 12 |
| ND1245-1Russ | 6.4 | 6.4 | 6.4 | 6.5 | 10 |
| ND1378-4Russ | 8.2 | 7.0 | 6.9 | 7.4 | 2 |
| ND1380-1Russ | 4.9 | 5.4 | 5.2 | 5.2 | 17 |
| ND1394-1Russ | 6.5 | 6.5 | 6.8 | 6.6 | 9 |
| ND1520-3Russ | 5.0 | 5.0 | 4.7 | 4.9 | 18 |
| AT9-77255-7Russ | 7.5 | 7.3 | 7.2 | 7.3 | 4 |

Rating Guide

7-9 -- Good
 5-6 -- Fair, but acceptable
 1-4 -- Poor, not acceptable

^{1/} All french fries were tested three times except Russet Burbank and Ore Ida which were tested fifteen times. Average scores are from these tests. Samples were grown in the 1984 trials and french fry sensory tests were made in 1983.

North Dakota Table 7. 1985 Cooking Tests of Cultivars and Selections Grown at Grand Forks and Park River, North Dakota - 1981^{1/}

| Cultivar or Selection | Boiling | | | | | |
|-----------------------|-------------------------|-------------------------|---------------|---------------|---|----------------------|
| | Sloughing ^{2/} | Mealiness ^{3/} | Color | | Color 4 Hours After Cooking ^{4/} | Flavor ^{5/} |
| | | | After Cooking | After Cooking | | |
| Kennebec | 8.8 | 7.3 | 7.3 | 8.0 | 7.3 | 6.9 |
| Norchip | 7.8 | 7.6 | 8.0 | 8.0 | 6.9 | 7.1 |
| Norgold Russet | 7.3 | 8.3 | 8.3 | 8.5 | 7.5 | 7.7 |
| Norking Russet | 7.3 | 8.7 | 7.8 | 7.5 | 8.1 | 7.8 |
| Norland | 8.8 | 6.6 | 7.5 | 8.3 | 6.6 | 6.9 |
| Red Pontiac | 8.8 | 7.0 | 8.8 | 9.3 | 7.6 | 7.3 |
| Redsen | 8.8 | 6.4 | 7.5 | 6.8 | 6.8 | 6.9 |
| Russet Burbank | 7.3 | 8.3 | 8.8 | 9.5 | 7.5 | 6.6 |
| RE5788 | 6.8 | 8.4 | 7.3 | 7.0 | 8.3 | 6.1 |
| TND22-2 | 2.3 | 7.9 | 8.5 | 8.8 | 7.9 | 6.8 |
| ND55-7 | 4.8 | 7.9 | 8.0 | 8.5 | 6.4 | 6.9 |
| ND372-2R | 7.8 | 6.6 | 7.0 | 8.3 | 7.4 | 7.3 |
| ND534-4Russ | 6.5 | 7.9 | 7.0 | 8.3 | 7.5 | 7.1 |
| ND649-4R | 8.3 | 7.5 | 7.0 | 8.5 | 6.9 | 7.1 |
| ND651-9 | 6.5 | 8.1 | 8.0 | 7.8 | 7.1 | 7.3 |
| ND678-8 | 7.0 | 8.3 | 8.3 | 9.0 | 7.4 | 7.1 |
| ND791-5R | 9.3 | 6.9 | 8.0 | 7.5 | 6.9 | 7.0 |
| ND860-2 | 8.3 | 7.4 | 6.8 | 5.5 | 7.3 | 6.3 |
| ND967-1Russ | 6.8 | 6.9 | 7.3 | 8.8 | 7.1 | 7.9 |
| ND1086-7R | 9.0 | 6.6 | 7.8 | 9.3 | 7.6 | 7.8 |
| ND1118-1 | 7.0 | 6.5 | 7.8 | 7.5 | 5.6 | 6.8 |
| ND1145-13R | 9.0 | 7.5 | 8.8 | 9.5 | 5.9 | 7.0 |
| ND1215-1 | 7.0 | 7.3 | 6.5 | 8.5 | 7.3 | 6.8 |
| ND1323-1 | 6.5 | 8.3 | 7.8 | 7.5 | 6.6 | 6.8 |

1[/] Average of two locations (Grand Forks and Park River)

2[/] Severe Sloughing - 1; No Sloughing - 10

3[/] Not Mealy - 1; Very Dry and Mealy - 10

4[/] Dark - 1; Very White - 10

5[/] Dark - 1; Very White - 10

6[/] Poor Flavor - 1; Excellent Flavor - 10

THE OHIO STATE UNIVERSITY, OHIO AGRICULTURAL RESEARCH &
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Introduction: This report contains the results on various
trials conducted over the state for the 1985 season. The report
contains data on marketable yield, percent Bees, percent culls,
includes results on specific gravity, and chip color collected
immediately after harvest.

Over 90 potato cultivars and advanced selections were evaluated
in trials across Ohio in 1985. These evaluations included:

- 1 - Statewide trials of 10 entries located on six farms.
- 2 - Two observation trials of 18 newer entries located on
two farms from the statewide trials.
- 3 - Replicated plots at the Muck Crops Branch in Celeryville,
Ohio.
- 4 - The North East Potato Cultivar evaluation program
(22 entries).
- 5 - The North Central Potato Trials (23 entries).
- 6 - 71 observational breeding lines at OARDC, Wooster, Ohio.
- 7 - A trial of 11 entries in replicated plots at the
Campbell Institute for Research and Technology, Campbell
Soup Co., Napoleon, Ohio.

Statewide Trial: Ten entries were evaluated on six farms
located across Ohio. These farms were selected to give
different soil and climatic conditions. The participants in
the 1985 statewide trials were:

| <u>Cooperating Farms</u> | <u>Soil Type</u> |
|---|--------------------------------|
| Becker's Falls Farms, Beach City, Ohio | Sandy - silt loam |
| Celeryville Muck Crops Branch, Celeryville, Ohio | Muck soil |
| Chase Farms, Defiance, Ohio | Sandy loam |
| Logan Farms, Mt. Gilead, Ohio | Silt loam - silty clay loam |
| Galen Moomaw Farms, Smithville, Ohio | Silt loam |
| Harold Thompson, Smithville, Ohio | Silt loam |
| John Mellinger, Leetonia, Ohio | Silt loam |

The 10 cultivars evaluated in this year's over the state trials
were:

- | | |
|----------------|-----------------|
| 1. Conestoga | 6. LA01-38 |
| 2. Norking | 7. Norchip S |
| 3. Campbell 14 | 8. Katahdin |
| 4. Yukon Gold | 9. BR 5991-WV16 |
| 5. Norchip | 10. WNC 521-12 |

Katahdin and Norchip were included as standards. The Katahdin
potato has been grown in Ohio for many years as a standard mid-
season variety, primarily for fresh market. The Norchip was
included as a standard for chipping tests even though the
variety is not as popular in Ohio as in previous years.

Methods and Materials: The plots on the six commercial farms were grown under standard cultural and pest control practices as practiced by each farm. Plots consisted of double rows approximately 40 feet long (80 seed pieces) and the entries were included in the plots at Celeryville (muck soil). Stand, plant vigor, visible diseases, and other observations were made during the growing season.

At harvest, tubers were dug with a conventional level-bed digger, left on the soil surface to dry for approximately one hour, then picked up by hand and weighed for total yield for the plot. A 50 pound sample was randomly selected from each replicate for grading.

The 50 pound sample was graded according to U.S. standards in so far as possible. Observations were made on exterior quality characteristics. Ten of the medium to large size tubers were selected from this grading table for cutting and evaluation for hollow heart, internal necrosis and other internal problems. Dave Kelly made the same observations on all six farms.

Approximately 20 pounds of tubers were taken from each graded sample and evaluated for specific gravity, and chipping potential by Dr. Winston Bash at the OSU-Pilot Plant Facility.

A composite soil sample was taken after harvest from the plots on each farm. Soil analyses were made at the REAL Laboratory, OARDC, Wooster, Ohio. See Table 1.

Table 1. Soil Tests for the Cooperating Farms

| Cooperating Farms | pH | Available (lbs/a) | | | | | | | CEC | % Base Satur. | | |
|----------------------|-----|-------------------|-----|------|-----|-----|------|-----|-----|---------------|----|-----|
| | | P | K | Ca | Mg | Mn | Zn | B | | Ca | Mg | K |
| Becker | 5.3 | 682 | 364 | 1200 | 128 | 134 | 11.7 | .6 | 8 | 39 | 7 | 6.1 |
| Thompson | 5.8 | 244 | 444 | 1550 | 357 | 109 | 19.4 | .8 | 11 | 36 | 14 | 5.3 |
| Mellinger | 5.1 | 968 | 596 | 1210 | 136 | 150 | 22.4 | .8 | 14 | 22 | 04 | 5.5 |
| Moomaw | 5.5 | 250 | 462 | 1210 | 352 | 107 | 23.9 | 1.0 | 13 | 38 | 11 | 4.5 |
| Logan | 5.8 | 96 | 273 | 2480 | 356 | 39 | 8.7 | .9 | 12 | 53 | 12 | 3.0 |
| Chase | 5.1 | 186 | 276 | 3630 | 243 | 51 | 14.3 | 1.3 | 18 | 51 | 6 | 2.0 |

Soil analysis by REAL Laboratory, OARDC, Wooster, Ohio.

Table 2. Planting Dates and Rainfall Records - Statewide Trials, 1985.

| | Becker | Thompson | Mellinger | Moomaw | Chase | Logan |
|-----------------------------|----------|----------|-----------|----------|----------|----------|
| Planting Date | May 7 | May 4 | May 10 | May 13 | May 8 | May 12 |
| Date Killed | None | Sept. 12 | Sept. 12 | Sept. 15 | Sept. 15 | Sept. 17 |
| Date Harvested | Sept. 19 | Oct. 1 | Oct. 2 | Oct. 10 | Oct. 9 | Oct. 8 |
| Rainfall | | | | | | |
| Planting to Harvest | | | | | | |
| May | " | 7.6 | 5.1 | 7.5 | 1.8 | 4.01 |
| June | " | 4.8 | 3.15 | 3.8 | 2.0 | 3.70 |
| July | " | 4.2 | 2.4 | 3.65 | 2.0 | 4.75 |
| August | " | 4.2 | 2.3 | 4.8 | 4.45 | 5.41 |
| September | " | 0.8 | 0.53 | 1.0 | 2.95 | 1.90 |
| October | " | " | 0.25 | 0.45 | 0.25 | 0.25 |
| Irrigation | 7/15 1" | | | | | |
| Total Water | | | | | | |
| Planting to Harvest - | | 21.6 | 13.95 | 21.0 | 13.45 | 20.02 |
| Planting to Killing | | | | | | |
| Spray - | | 20.8 | 13.20 | 20.25 | 11.75 | 19.00 |
| June, July, & Aug. - | | 13.20 | 7.85 | 12.25 | 9.40 | 13.85 |
| Average Total Yield (cwt/A) | 250 | 310 | 403 | 324 | 428 | 314 |

Notes: Average of six farms 388 cwt/A. Daily records indicate that the distribution of the rainfall is of greater importance in determining yields than total rainfall, particularly for some of the earlier cultivars.

Table 3. Average % Stand, Total Yield, Specific Gravity, and Average % US No. 1, B Size, and Specific Gravity for the Statewide Trials - Six Farms, 1985.

| Cultivar | Average Stand (%) | Average | | | | | |
|--------------|-------------------|---------------------|------------|------------------|--------|-----------------|------|
| | | Aver. Yield (cwt/A) | | Specific Gravity | | Average Percent | |
| | | Total | U.S. No. 1 | U.S. No. 1 | B Size | Culls | |
| Conestoga | 93 | 305 | 266 | 1.082 | 87 | 4.7 | 8.3 |
| Norking | 95 | 295 | 252 | 1.079 | 86 | 4.5 | 7.8 |
| Campbell 14 | 90 | 370 | 333 | 1.074 | 90 | 4.7 | 5.4 |
| Yukon Gold | 83 | 291 | 266 | 1.081 | 90 | 2.8 | 6.8 |
| Norchip | 92 | 295 | 228 | 1.078 | 79 | 6.8 | 14.7 |
| LA01-38 | 79 | 388 | 359 | 1.080 | 92 | 2.4 | 5.4 |
| Norchip S | 77 | 278 | 186 | 1.079 | 68 | 5.4 | 26.8 |
| Katahdin | 93 | 395 | 335 | 1.070 | 84 | 4.5 | 11.5 |
| BR 5991-WV16 | 80 | 397 | 321 | 1.083 | 81 | 6.5 | 12.9 |
| WNC 521-12 | 86 | 367 | 325 | 1.094 | 89 | 3.6 | 7.8 |

Maturity Season - 1985

Very Early (Less than 110 days)

Conestoga

Early (110-115 days)

Norking (ND388-1)

Medium Early - Early Midseason (116-125 days)

Yukon Gold, Norchip

Medium or Midseason (126-135 days)

Campbell 14, LA01-38, Katahdin, Norchip S

Late (136-140 days)

WNC521-12

Very Late (141 and more days)

BR5991-WV16

OBSERVATION TRIALS-STATEWIDE TRIALS

Introduction: Eighteen entries were evaluated in observation plots on two farms in Columbiana County. Most entries were new promising lines which were evaluated previously in Ohio trials at the Ohio Agricultural Research and Development Center, Wooster, or in other observation trials in Ohio. In some instances, potato breeders in other states suggested varieties to be included in these observation plots.

In addition, observation plots were installed at the Ohio Agricultural Research and Development Center, Wooster. This plot was adjacent to the North Central and Northeastern trials which are discussed later.

Procedure: The plots for the observation trials were handled in the same manner as for the over-the-state trials. Plot size consisted of two rows, approximately 25 feet long (50 seed pieces). Stand, plant vigor, and apparent diseases were evaluated during the growing season. Harvest procedures were the same as described earlier for the over-the-state plots. A composite sample was selected from each entry for chipping, specific gravity, and other quality tests.

Table 4. Yield and Grade of Observation Entries in the Statewide Trials.

| | THOMPSON | | MELLINGER | |
|----------------|---------------|--------------|---------------|--------------|
| | Yield (cwt/A) | % U.S. No. 1 | Yield (cwt/A) | % U.S. No. 1 |
| Ontario | 357 | 82 | 463 | 81 |
| MS700-70 | 338 | 89 | 482 | 88 |
| AK10-1 | 300 | 87 | 360 | 86 |
| Kennebec | 294 | 79 | 478 | 89 |
| CF7688-9 | 273 | 86 | 321 | 87 |
| ND534-4 | 269 | 90 | 318 | 88 |
| G670-11 | 267 | 86 | 450 | 91 |
| Yankee Clipper | 265 | 75 | 317 | 86 |
| MN11373 | 263 | 83 | 302 | 85 |
| ND398-1 | 263 | 87 | 290 | 85 |
| Jemseg | 233 | 88 | 294 | 91 |
| Atlantic | 229 | 89 | 312 | 89 |
| W903 | 211 | 88 | 240 | 86 |
| Superior | 178 | 88 | 246 | 85 |
| WF564-3 | 192 | 86 | 284 | 85 |
| AF330-1 | 165 | 81 | 314 | 87 |
| Simcoe | 158 | 86 | | |
| Sunrise | 132 | 88 | | |

Table 5. Observation-Statewide Trials: Yield, Specific Gravity, and Chip Color.

| | THOMPSON | | | | MELLINGER | | | |
|----------------|---------------|------------------|---------|--------|---------------|------------------|--------|--------|
| | Yield (cwt/A) | Specific Gravity | PC/SFA* | Agtron | Yield (cwt/A) | Specific Gravity | PC/SFA | Agtron |
| Ontario | 357 | 1.074 | 3 | 43.0 | 463 | - | - | - |
| MS700-70 | 338 | 1.085 | 2 | 59.5 | 482 | 1.080 | 2 | 60.1 |
| AK10-1 | 300 | 1.084 | 2 | 52.1 | 360 | 1.075 | 3 | 52.3 |
| Kennebec | 294 | 1.077 | 1 | 63.2 | 478 | 1.074 | 2 | 61.9 |
| CF7688-9 | 273 | 1.089 | 1 | 63.0 | 321 | 1.090 | 2 | 59.5 |
| ND534-4 | 269 | 1.068 | 3 | 37.6 | 318 | - | - | - |
| G670-11 | 267 | 1.083 | 2 | 57.2 | 450 | - | - | - |
| Yankee Chipper | 265 | 1.082 | 2 | 60.9 | 317 | 1.080 | 2 | 64.4 |
| MN11373 | 263 | 1.078 | 3 | 43.7 | 302 | - | - | - |
| ND398-1 | 263 | 1.080 | 2 | 52.0 | 290 | - | - | - |
| Jemseg | 233 | 1.068 | 2 | 45.3 | 294 | 1.082 | 1 | 58.7 |
| Atlantic | 229 | 1.093 | 1 | 57.6 | 312 | 1.098 | 2 | 60.1 |
| W903 | 211 | 1.082 | 2 | 60.9 | 240 | 1.069 | 2 | 60.7 |
| Superior | 178 | 1.077 | 1 | 62.6 | 246 | 1.082 | 2 | 60.9 |
| WF564-3 | 192 | 1.073 | 2 | 49.9 | 284 | 1.080 | 2 | 61.5 |
| AF330-1 | 165 | 1.080 | 1 | 60.9 | 314 | - | - | - |
| Simcoe | 158 | 1.084 | 2 | 60.1 | - | 1.080 | 1 | 63.3 |
| Sunrise | 132 | 1.070 | 2 | 59.2 | - | 1.083 | 2 | 60.6 |

*PC/SFA - Scale of 1 to 5, with 1 being light colored and 5 being dark.

Very Early (less than 110 days)

Sunrise

Early (110-115 days)

Superior 111

WF564-3 114

Jemseg 115

Medium Early or Early Midseason (116-125 days)

CF7688-9 119 Simcoe 120 ND3981 120

ND534-4 120 Atlantic 121 Y. Clipper 123

AF330-1 125 MN11373 125

Medium or Midseason (126-135 days)

Kennebec 126 W903 127 MS700-70 134

Late (136-140 days)

AK10-1 140

Very Late (142+ days)

G670-11 Ontario 145

Table 6. Yield and Grade Classification of Potato Cultivar Evaluation at the Muck Crops Branch, Celeryville, Ohio.

| Cultivar | Yield U.S. #1 cwt/A | Percent | | |
|------------|------------------------|----------------|--------|-------|
| | | U.S. #1 Tubers | B Size | Culls |
| Yukon Gold | 333 | 82 | 3.2 | 13.8 |
| Chipbelle | 331 | 78 | 5.6 | 15.8 |
| Conestoga | 378 | 69 | 13 | 17.3 |
| Monona | 427 | 84 | 2.1 | 13.7 |
| LA01-38 | 487 | 77 | 2.3 | 20.2 |

Table 6 (continued). Yield and Grade Classification of Potato Cultivar Evaluation at the Muck Crops Branch, Celeryville, Ohio.

| Cultivar | Yield U.S. #1 cwt/A | Percent | | |
|--------------|------------------------|----------------|--------|-------|
| | | U.S. #1 Tubers | B Size | Culls |
| Belchip | 308 | 77 | 3.0 | 19.1 |
| WIS 779 | 344 | 68 | 2.7 | 28.8 |
| NY 59 | 496 | 82 | 2.7 | 14.7 |
| Bake King | 380 | 83 | 6.8 | 9.7 |
| BR 5991-WV16 | 325 | 79 | 4.8 | 16.0 |
| ND 388-1 | 379 | 81 | 4.2 | 13.8 |
| AF 330-1 | 369 | 76 | 3.3 | 20.5 |
| ND 860-2 | 330 | 85 | 6.9 | 8.0 |
| 521-12-WNC | 289 | 82 | 3.6 | 13.4 |
| Katahdin | 447 | 80 | 4.2 | 14.9 |
| Norchip | 362 | 77 | 4.8 | 17.8 |
| Hampton | 394 | 84 | 2.1 | 13.1 |
| NY 64 | 221 | 435 | 3.7 | 16.4 |
| LSD (0.05) | 71.32 | 12.19 | 5.88 | 7.95 |

Fertilizer: broadcast 860 lbs of 6-24-6/A

Seed Piece Spacing: 12"

Rows: 32" apart.

Vine Killer: Dinitro + Diesel oil.

Table 7. Yield, Grade, Specific Gravity, and Chipping Characteristics for the Observation Entries, Wooster, Ohio, 1985.

| | Percent Stand | Total Yield cwt/A | Percent | | | Specific Gravity | PCSFA | Agtron |
|----------------|------------------|-------------------------|---------|--------|-------|---------------------|-------|--------|
| | | | U.S. #1 | B Size | Culls | | | |
| A71-72-1 | 100 | 409 | 83 | 16 | 1 | 1.076 | 2 | 57.0 |
| ND7003-2 | 93 | 479 | 87.6 | 5.4 | 7 | 1.075 | 2 | 60.6 |
| B9540-62 | 100 | 407 | 86.6 | 7.4 | 6 | 1.077 | 2 | 56.5 |
| G76224 | 87 | 235 | 83.8 | 11.2 | 5 | 1.102 | 3 | 52.5 |
| 7718-2 | - | 382 | 84.8 | 6.2 | 9 | 1.089 | 3 | 41.1 |
| WF31-4 | 83 | 491 | 86.3 | 4.7 | 9 | 1.092 | 1 | 63 |
| B9540-55 | 87 | 368 | 87 | 5.1 | 8 | 1.072 | 2 | 46.9 |
| AF303-5 | 90 | 462 | 89 | 4.4 | 7 | 1.079 | 2 | 61.4 |
| B8943-4 | 70 | 319 | - | - | - | - | - | - |
| F72217 | 83 | 431 | 91.2 | 2.8 | 6 | 1.080 | 3 | 42.6 |
| A76147-2 | 93 | 828 | 77 | 4.0 | 19 | 1.077 | 3 | 46.8 |
| B9596-2 | 67 | 387 | 86.6 | 2.6 | 7 | 1.079 | 3 | 46.6 |
| CF7523-1 | 90 | 615 | 86 | 5.0 | 9 | 1.083 | 3 | 43.2 |
| NY 64 | 83 | 479 | 90 | 2.0 | 8 | 1.084 | 3 | 51.8 |
| B0042-7 | 100 | 443 | 76 | 6.0 | 18 | 1.086 | 1 | 66.0 |
| B0038-5 | 95 | 368 | 86.8 | 5.2 | 8 | 1.086 | 1 | 67.2 |
| B0036-6 | 100 | 428 | 85.8 | 1.2 | 13 | 1.072 | 1 | 67.7 |
| Red LaSoda(E) | 100 | 515 | 88.6 | 3.4 | 8 | - | - | - |
| Norland | 83 | 366 | 88.4 | 5.6 | 6 | - | - | - |
| D. Red Norland | 87 | 319 | 87.4 | 7.6 | 5 | - | - | - |
| B0045-6 | 87 | 486 | 82.6 | 5.4 | 12 | 1.085 | 2 | 62.0 |
| B0046-14 | 93 | 373 | 78.8 | 10.2 | 11 | 1.080 | 1 | 64.9 |

Table 7 (continued). Yield, Grade, Specific Gravity, and Chipping Characteristics for the Observation Entries, Wooster, Ohio, 1985.

| | Percent Stand | Total Yield cwt/A | Percent | | | Specific Gravity | PCSFA | Agtron |
|------------------|---------------|-------------------|---------|--------|-------|------------------|-------|--------|
| | | | U.S. #1 | B Size | Culls | | | |
| B 9792-2B | 97 | 365 | 82.7 | 2.8 | 9 | 1.090 | 1 | 60.7 |
| Chieftan | 97 | 498 | 87.4 | 2.6 | 10 | - | - | - |
| Batouche | 87 | 496 | 96.2 | 2.8 | 1 | - | - | - |
| Viking | 73 | 353 | 89.6 | 0.4 | 10 | - | - | - |
| B9792-153 | 87 | 455 | 76.2 | 0.8 | 23 | 1.082 | 1 | 67.9 |
| B9792-53 | 80 | 448 | 87 | 2.0 | 11 | 1.094 | 1 | 62.5 |
| B9792-8B | 87 | 656 | 67.2 | 3.8 | 29 | 1.095 | 2 | 62.5 |
| Red LaSoda-R | 97 | 620 | 87.2 | 3.8 | 9 | - | - | - |
| Red Sport Viking | 80 | 380 | 93.8 | 0.2 | 6 | - | - | - |
| Red LaSoda-M | 93 | 537 | 89 | 3.0 | 8 | - | - | - |
| B9792-196 | 80 | 450 | 85.8 | 6.2 | 8 | 1.095 | 2 | 58.8 |
| WNC 567-1 | 70 | 407 | 81 | 7.0 | 12 | 1.072 | 3 | 35.3 |
| TC 582-1 | 87 | 402 | 85.8 | 6.2 | 8 | 1.095 | 1 | 56.8 |
| AC 77513-1 | 87 | 411 | 79.8 | 4.2 | 16 | 1.085 | 3 | 45.8 |
| AC 77652-1 | 87 | 375 | 83.8 | 2.2 | 14 | 1.068 | 3 | 38.0 |
| AF 236-1 | 80 | 552 | 83.6 | 1.4 | 15 | - | - | - |
| Cabrie | 93 | 467 | 88.8 | 1.2 | 10 | 1.074 | 1 | 60.2 |
| Redsen | 80 | 319 | 92.2 | 4.8 | 3 | - | - | - |
| W870 | 67 | 324 | 81.8 | 4.2 | 14 | 1.091 | 1 | 56.7 |
| W856 | 83 | 428 | 84.2 | 2.8 | 13 | 1.084 | 1 | 53.6 |
| W887 | 80 | 288 | 76 | 3.0 | 21 | 1.089 | 1 | 53.7 |
| MS 002-171Y | 100 | 489 | 89.6 | 3.4 | 7 | - | - | - |
| G 701511RY | 87 | 336 | 85.4 | 4.6 | 10 | - | - | - |
| 78-LC-1 | 97 | 353 | 89 | 5.0 | 6 | 1.080 | 3 | 38.6 |
| W906 | 83 | 426 | 81.8 | 2.2 | 16 | 1.094 | 1 | 59.0 |
| W879 | 73 | 332 | 89 | 2.0 | 9 | 1.090 | 1 | 53.0 |
| W742 | 93 | 373 | 91 | 2.0 | 7 | 1.092 | 3 | 46.3 |
| AF330-1 | 70 | 382 | 83.4 | 1.6 | 15 | 1.083 | 1 | 66.3 |
| CF 7353-1 | 87 | 426 | 90.6 | 0.4 | 9 | 1.079 | 2 | 61.3 |
| OS-005 | 93 | 494 | - | - | - | 1.085 | 2 | 57.7 |
| A 129.70-3 | 97 | 373 | 86.6 | 1.4 | 12 | 1.072 | 2 | 58.6 |
| BN 9820-3 | 93 | 590 | 80.4 | 1.6 | 18 | 1.070 | 3 | 45.8 |
| BN 9855-2 | 100 | 675 | 85.2 | 0.8 | 14 | 1.068 | 1 | 54.5 |
| ND860-2 | 93 | 416 | 85 | 5.0 | 10 | 1.085 | 1 | 62.8 |
| ND534-4 | 94 | 399 | 89.6 | 7.4 | 3 | 1.075 | 2 | 52.2 |
| ND678-8 | 90 | 409 | 83 | 9.0 | 8 | 1.079 | 1 | 65.7 |
| MS 704-10 | 100 | 450 | 89.4 | 5.6 | 5 | 1.083 | 2 | 58.6 |
| MS 702-80 | 97 | 399 | 86.4 | 2.6 | 11 | 1.078 | 1 | 67.4 |
| BN 9803-1 | 90 | 448 | 87.4 | 3.6 | 9 | 1.082 | 1 | 57.9 |
| MS 702-91 | 83 | 600 | 75 | 1.0 | 24 | 1.074 | 1 | 61.7 |
| MS 700-83 | 87 | 414 | 90.4 | 5.6 | 4 | 1.084 | 1 | 55.9 |
| ND 651-9 | 100 | 416 | 87.6 | 5.4 | 7 | 1.083 | 1 | 61.6 |
| MS 700-79 | 90 | 361 | 89 | 3.0 | 8 | 1.087 | 1 | 62.5 |
| MS 701-22 | 83 | 332 | 90 | 2.0 | 8 | 1.086 | 1 | 56.5 |
| MS716-15 | 100 | 518 | 91 | 2.0 | 7 | 1.085 | 1 | 57.2 |

CAMPBELL INSTITUTE FOR RESEARCH AND TECHNOLOGY POTATO TRIALS

Procedures:

- A. Location - CIRT Research Farm, Napoleon, Ohio
- B. Planting Date: May 16, 1985
- C. Harvest Date: September 27, 1985
- D. Experimental Design: Randomized Complete Block
- E. Replications: 4
- F. Row Spacing: 34 inches
- G. In-Row Spacing: 10 inches
- H. Plot Size: 1 Row, 20 Feet
- I. Fertilizer: Broadcast - 50-100-200
Planting - 30-130-130
Sidedress - 50- 0- 0
- J. Disease and Insect Control: Dithane with zinc
and Sevin
- K. Herbicide: Dual plus Sensor - pre-emergence

Table 8. Total and Marketable Yield of Potato Varieties, Napoleon, Ohio, 1985.

| Cultivar | Total Yield (cwt/A) | Percent Marketable (over 1 7/8") | Marketable Yield (cwt/A) |
|------------------|---------------------------|--|--------------------------------|
| BR 5991-WV16 | 632 | 89.8 | 569 |
| WVC521-12 | 544 | 92.4 | 502 |
| Katahdin | 494 | 94.5 | 467 |
| LA01-38 | 470 | 94.5 | 444 |
| C-14 | 453 | 90.3 | 409 |
| Norchip-5 | 406 | 90.6 | 367 |
| Norchip | 380 | 73.7 | 282 |
| Yukon Gold | 354 | 89.1 | 316 |
| Simcoe | 342 | 84.1 | 289 |
| Conestoga | 285 | 80.7 | 232 |
| ND 388 | 249 | 67.1 | 170 |
| Bayes LSD (0.05) | 85.6 | 6.2 | 85.2 |
| C.V. | 15.2 | 5.4 | 17.3 |

NORTHEASTERN REGIONAL TRIAL

Procedure: Twenty-two varieties and selections were evaluated in this NER plot at the Ohio Agricultural Research and Development Center, Wooster, Ohio. Katahdin was included as a standard variety since this variety is commonly grown in Ohio. The other 21 selections were entries from the various breeders.

Plots were single rows, 30 feet long, and were replicated three times in a randomized complete block design. The plot was planted May 15 in excellent soil conditions. The vines were killed (with Diquat) September 3.

The fertility program consisted of 1200 pounds of 10-20-20, one-half applied as a plow-down application and the remainder applied in bands at planting time. Dual/Lexone combination was applied immediately after planting. Fungicides and insecticides were applied as suggested in the pesticide guide from the Ohio Cooperative Extension Service.

Plots were harvested September 16 and 17 and tubers were picked by hand and weighed for a gross yield per plot. A 50-pound sample was taken from each plot for grading into U.S. No. 1, B's and culls. At grading time (November 1), tubers were also evaluated for internal and external defects. At harvest, a 20-pound sample was collected at random for specific gravity and chipping qualities. This work was done in the pilot plant in the Department of Horticulture, The Ohio State University, Columbus, Ohio, under the supervision of Dr. Winston Bash.

Results of North East Potato Clone Evaluation: Total yield, marketable yield greater than 1 7/8", percent defects, specific gravities, plant appearance, and tuber appearance are presented in the accompanying tables. Hampton rated first in U.S. No. 1 tubers (cwt/A). Other yields in order of ranking were: Atlantic, Yankee Supreme, N. Y. 59, and WF 752. The highest percentage of U.S. No. 1 tubers was produced by MN7973 followed by Yukon Gold, Hampton, Katahdin, and Yankee Supreme. Denali had the highest specific gravity at 1.095. Several varieties were found to have similar specific gravities at 1.092 and included W752 and CF1688-9. Atlantic was the next highest.

Kennebec had the greatest percentage of tuber defects mostly attributed to secondary growth and sunburn. Other clones with a high percentage of tuber defects included AF9058M, WF564-15, and NY 59.

Internal Defects: Atlantic had the highest percentage of internal necrosis (60 percent of sampled tubers). NY 59 which ranked fourth in marketable yield had 40 percent internal necrosis. Yankee Supreme also had problems with hollow heart.

NORTH CENTRAL REGIONAL TRIAL

Procedure: Twenty-three varieties and selections were evaluated in the NCR plot at the Ohio Agricultural Research and Development Center, Wooster, Ohio. These 23 varieties included Norland, Red Pontiac, Norchip, Russet Burbank, and Norgold Russet as standard varieties.

Plots were single rows, 30 feet long, and were replicated three times in a randomized complete block design except for the three Minnesota selections - MN 10874, MN 11373, and MN 11795 which were in single plots. The plot was planted May 14 and the vines were killed (with Diquat) September 3.

The fertilizer program consisted of 1200 pounds of 10-20-20, one-half applied as a plow-down application and the remainder applied in bands at planting time. Dual/Lexone combination was applied immediately after planting. Fungicides and insecticides were applied during the growing season as suggested in the pesticide guides from the Ohio Cooperative Extension Service.

Plots were harvested September 16 and 17 and tubers were picked by hand and weighed for gross yield per plot. A representation sample - approximately 50 pounds - was taken from each replicate to be graded for U.S. No. 1, B.S., and culls. At grading time, tubers were also evaluated for internal and external defects. At harvest, a 20 pound sample was collected for specific gravity and other chipping characteristics. A maturity rating was made August 25.

Results of North Central Regional Clone Evaluation: Total yield, marketable yield greater than 1 7/8", percent defects, specific gravities, plant appearance, and tuber appearance. The overall top rated selections in order of ranking were: LA01-38, LA12-59, ND651-9, BN9815-3, and MS716-15.

Table 9. Gross Yield, Percent U.S. No. 1, Maturity, and Chip Data North Central Regional Trial. Ohio Agricultural Research and Development Center, Wooster, Ohio, 1985.

| | | cwt/A | | | | | |
|--------------------------------|----|-------|---------|-------|--------------------|--------------------|-------------------------------|
| Selection Number or Variety | | cwt/A | Aver. | Aver. | Gen. ^{3/} | Chip ^{4/} | Comments and General Notes |
| | | Yield | Percent | Total | Merit | | |
| EARLY TO MEDIUM EARLY | | | | | | | |
| Norland | 18 | 460 | 400 | 87 | 18.10 | | Good red color |
| MN 11705 | 6 | 388 | 306 | 78 | 19.79 | | Sprouting |
| NE 9.75-1 | 9 | 600 | 520 | 86 | 19.16 | | Internal defects |
| ND 651-9 | 12 | 571 | 494 | 86 | 19.16 | 3 | |
| ND 860-2 | 13 | 471 | 406 | 86 | 20.64 | | Sprouting |
| MEDIUM TO LATE | | | | | | | |
| La 12-59 | 1 | 640 | 559 | 87 | 20.64 | 2 | |
| La 01-38 | 2 | 580 | 535 | 92 | 20.00 | 1 | |
| MS700-83 | 3 | 512 | 450 | 87 | 18.94 | | |
| MS704-10 | 4 | 477 | 395 | 82 | 21.27 | | |
| MS716-15 | 5 | 526 | 473 | 89 | 21.06 | 5 | Promising |
| G670-11 | 23 | 514 | 438 | 84 | 22.33 | | |
| MN 11816 | 7 | 507 | 423 | 83 | 17.68 | | Elongated |

Table 9 (continued). Gross Yield, Percent U.S. No. 1, Maturity, and Chip Data North Central Regional Trial. Ohio Agricultural Research and Development Center, Wooster, Ohio, 1985.

| | | cwt/A | | Gen. ^{3/} | | | Chip ^{4/} | Comments and General Notes |
|--------------------------------|----|-------------------------|--------------------------|----------------------------|--------------------------|-------------------------|--------------------|-------------------------------|
| Selection Number or Variety | | cwt/A Aver. Yield | Aver. Yield U.S.#1 | Aver. Percent U.S.#1 | Aver. Total Solids | Gen. Merit Rating | | |
| MEDIUM TO LATE (continued) | | | | | | | | |
| MN 11903 | 8 | 488 | 400 | 89 | 18.95 | | 62.0 | Shape problems |
| NE 106 | 10 | 500 | 416 | 83 | 21.06 | | 56.8 | Rhizoctonia |
| BN 9815-3 | 11 | 540 | 478 | 88 | 19.58 | 4 | 57.0 | Promising, attractive |
| ND671-4Russ | 14 | 516 | 442 | 85 | 18.10 | | 53.4 | Promising |
| W 842 | 15 | 439 | 375 | 85 | 24.22 | | 56.0 | Wide size variation |
| W 903 | 16 | 471 | 406 | 86 | 17.89 | | 52.2 | Some greening |
| W 949R | 17 | 475 | 420 | 88 | 18.32 | | 45.8 | Nice |
| Red Pontiac | 19 | 773 | 664 | 85 | 18.10 | | 35.0 | Infected lenticels |
| Russet Burbank | 20 | 598 | 335 | 55 | - | | - | |
| Norgold Russet | 21 | 492 | 435 | 88 | 19.58 | | 23.2 | Uniform russet |
| Norchip | 22 | 495 | 404 | 81 | 20.64 | | 61.0 | 20% sprouting |

^{3/}Place top five among all entries including check varieties; disregard maturity classification. (Rate first, second, third, fourth, and fifth (in order) for overall worth as a variety).

^{4/}Chip Color - PCII Color Chart or Agtron

OREGON

A. Mosley, D. Hane, S. James, G. Carter, and C. Stanger

Introduction

Early Generation Selections: Approximately 90,000 single-hill progeny were evaluated in 1985. Fifty thousand were field-transplanted as true seedlings at Hermiston where the long, warm growing season allowed for full tuber maturity. The remaining 40,000 selections were planted as seedling tubers at Powell Butte and Hermiston. True seed and seedling tubers were provided primarily by J. Pavcek (Idaho). D. Holm (Colorado) and R. Johansen (North Dakota) also provided seedling tubers.

Typical 4- and 12-hill and replicated yield trials associated with a potato selection program were conducted. Oregon selections will be shared with Idaho and Washington as part of a cooperative Tri-state program.

Replicated Yield Trials: Replicated trials were conducted at nine locations. Four trials were situated in commercial fields. The remaining five were located on branch experiment stations at Hermiston, Powell Butte, Klamath Falls and Ontario and at the OSU main campus, Corvallis. Data presented here will be restricted to on-station trials. These will be categorized as the "Statewide", "Western Regional" and "Willamette Valley" trials.

Statewide Tests

Twenty-eight entries were compared at Hermiston, Klamath Falls, Ontario and Powell Butte. Results are summarized in Tables 1-4 with an overall summary for all locations in Table 5.

Powell Butte and Klamath Falls have short, cool growing seasons with the possibility of frost at any time. Early-maturing selections are somewhat favored under these conditions. Hermiston and Ontario, conversely have long growing seasons allowing for full maturity and maximum yields. The Ontario trial was furrow irrigated while all others were irrigated with sprinkler systems. Selections prone to off-shapes and knobbiness, such as Russet Burbank, generally perform relatively poorly at Ontario.

Some of the lines showing promise included A74212-1, ND534-4, A080570-10 and A080576-5 for tablestock and A7869-5, A7919-1, A7987-14, A79141-3, A08035-3 and C008014-1 for french fry processing. Numerous other lines showed promise at one or more locations. These will be evaluated further.

Sugar ends, that is french fries with dark ends, presented an extreme problem to the processing industry in the Ontario area in 1985. Increased emphasis will be placed on this problem in future tests.

Western Regional
Trial

Eleven entries were compared in the Western Regional Trial at Hermiston (Table 6). Harvest data were collected after 111 and 157 days. Two selections, A74114-4 and A76147-2, show some promise for early processing. However, A74114-4 tended to produce a high percent of over-sized tubers and A76147-2 skins were white.

Lines performing relatively well at 157 days included A7411-2 and A74114-4. A7411-2 yielded less than Russet Burbank but had a higher percentage of U.S. No. 1 tubers, higher specific gravity, and equivalent french fry color with fewer sugar ends. It showed more blackspot bruise than Russet Burbank but less than Lemhi with minimal external and internal problems. A74114-4 produced exceptionally high total and U.S. No. 1 yields. Specific gravity was comparable to Russet Burbank but fry color and sugar ends were slightly worse. A74114-4 had few external and internal defects.

Willamette Valley
Trial

Sixteen entries were compared for chips and tablestock at Corvallis (Table 7). Rosa and ND860-2 showed some promise for chipping. ND860-2 yields were slightly low and tubers tended to be small. It matured early and could probably have been used effectively for early out-of-field processing. Chips were extremely light colored. ND860-2 is said to have potential for long-term cool storage, attributes important to the chipping industry.

A74212-1 yielded well and seemed to have some potential for fresh market. Tubers were long but somewhat lighter-skinned than Russet Burbank. ND534-4 normally performs extremely well for fresh market. Poor performance in this test may have been due to herbicide residue in the seed tubers.

Petiole $\text{NO}_3\text{-N}$ determinations on July 12 showed a broad range in tissue levels among the entries. It appears that attempts to tailor nitrogen fertilizer levels to specific entries may prove profitable.

Oregon Table 1. Yields, grade, fry, and tuber characteristics of Statewide Potato Variety Trial entries at Hermiston, 1985.

| Variety | Yield, cwt/A | | Specific Gravity | Fry ^{1/} Color | Sugar Ends, % | Sev. Rating ^{3/} | | | Int. ^{4/} Def., % |
|------------|--------------|------------|------------------|----------------------------|------------------|---------------------------|------|------|-------------------------------|
| | Total | U.S. No. 1 | | | | Scab | G.C. | S.B. | |
| A7411-2 | 579 | 467 | 86 | 0.92 | 24 | 5.0 | 3.2 | 4.5 | 2.0 |
| A74212-1 | 938 | 786 | 70 | 3.00 | 8 | 5.0 | 3.8 | 4.0 | 7.0 |
| A7869-5 | 843 | 717 | 69 | 1.44 | 60 | 5.0 | 4.2 | 4.2 | 11.0 |
| A7919-1 | 729 | 651 | 69 | 1.60 | 4 | 4.8 | 5.0 | 2.2 | 28.0 |
| A7987-14 | 679 | 540 | 74 | 1.48 | 28 | 5.0 | 2.8 | 4.5 | 9.0 |
| A79141-3 | 501 | 362 | 81 | 0.00 | 16 | 5.0 | 4.2 | 4.0 | 4.0 |
| A079492-2 | 760 | 612 | 73 | 1.72 | 64 | 2.0 | 4.5 | 4.2 | 13.0 |
| A08035-3 | 557 | 489 | 89 | 0.80 | 32 | 3.8 | 5.0 | 4.0 | 26.0 |
| A08035-8 | 371 | 271 | 65 | 1.56 | 52 | 4.8 | 4.2 | 4.8 | 6.0 |
| A0836-6 | 501 | 353 | 69 | 0.88 | 52 | 5.0 | 5.0 | 4.5 | 16.0 |
| A08036-18 | 565 | 471 | 67 | 0.72 | 60 | 5.0 | 5.0 | 4.2 | 4.0 |
| A08037-12 | 542 | 286 | 70 | 2.04 | 28 | 5.0 | 2.8 | 3.5 | 10.0 |
| A08096-10 | 572 | 447 | 88 | 2.28 | 36 | 4.0 | 5.0 | 3.0 | 7.0 |
| A080432-1 | 512 | 463 | 72 | 0.12 | 28 | 5.0 | 5.0 | 2.8 | 18.0 |
| A080432-7 | 604 | 474 | 73 | 2.56 | 12 | 4.5 | 4.8 | 2.5 | 5.0 |
| A080437-6 | 730 | 590 | 66 | 2.12 | 8 | 5.0 | 2.5 | 3.5 | 25.0 |
| A080437-7 | 476 | 398 | 75 | 1.72 | 20 | 4.8 | 3.5 | 3.2 | 8.0 |
| A080570-10 | 642 | 490 | 72 | 1.56 | 56 | 4.2 | 5.0 | 4.2 | 9.0 |
| A080576-5 | 492 | 378 | 71 | 2.48 | 48 | 5.0 | 5.0 | 3.8 | 14.0 |
| A080592-1 | 666 | 567 | 88 | 0.00 | 12 | 1.8 | 5.0 | 4.8 | 36.0 |
| B9792-69 | 431 | 358 | 69 | 9.99 | - | 1.5 | 5.0 | 4.5 | 13.0 |
| C008014-1 | 764 | 627 | 73 | 0.48 | 40 | 5.0 | 4.5 | 4.2 | 1.0 |
| C008018-3 | 438 | 342 | 62 | 0.52 | 48 | 4.8 | 4.2 | 4.5 | 7.0 |
| ND534-4 | 364 | 305 | 58 | 1.72 | 28 | 5.0 | 5.0 | 5.0 | 0.0 |
| NDA1309-6 | 538 | 466 | 88 | 0.16 | 24 | 5.0 | 5.0 | 3.5 | 49.0 |
| Lemhi R. | 614 | 544 | 88 | 0.16 | 24 | 5.0 | 5.0 | 4.0 | 38.0 |
| Norgold R. | 421 | 344 | 61 | 1.80 | 0 | 5.0 | 5.0 | 4.8 | 2.0 |
| R. Burbank | 763 | 535 | 76 | 1.00 | 44 | 4.5 | 3.8 | 4.2 | 20.0 |

1/ 1.0 omitted

2/ Low numbers indicate light color

3/ G.C. = growth cracks; S.B. = shatter bruise. 1 = severe; 5 = minor

4/ Includes hollow heart, brown center, internal brown spot, blackspot bruise, vascular discoloration.

Oregon Table 2. Yield and quality characteristics of Statewide Potato Variety Trial entries at Klamath Falls, 1985.

| Variety | Yield, cwt/A | | No. 1, % R.B. | % ^{1/} H.H. | Specific ^{2/} Gravity | Notes |
|------------|--------------|------------|------------------|-------------------------|-----------------------------------|---------------|
| | Total | U.S. No. 1 | | | | |
| A68678-2 | 289 | 251 | 89 | 0 | 67 | |
| A7411-2 | 354 | 188 | 67 | 6 | 74 | |
| A74212-1 | 510 | 413 | 146 | 7 | 67 | |
| A7869-5 | 297 | 214 | 76 | 0 | 68 | Rough |
| A7919-1 | 397 | 274 | 97 | 3 | 70 | Knobs |
| A7987-14 | 361 | 263 | 93 | 7 | 75 | Cracks, Knobs |
| A79141-3 | 520 | 338 | 120 | 10 | 74 | |
| A079492-2 | 456 | 378 | 134 | 10 | 66 | |
| A08035-3 | 400 | 272 | 96 | 13 | 71 | Knobs |
| A08035-8 | 307 | 169 | 60 | 3 | 67 | Cracks |
| A08036-6 | 401 | 269 | 95 | 7 | 68 | |
| A08036-18 | 341 | 242 | 86 | 0 | 65 | |
| A08037-12 | 361 | 235 | 83 | 14 | 71 | Rough |
| A08096-10 | 401 | 289 | 102 | 0 | 80 | Cracks, Rough |
| A080432-1 | 244 | 146 | 52 | 3 | 69 | Cracks |
| A080432-7 | 485 | 320 | 113 | 0 | 73 | |
| A080437-6 | 441 | 300 | 106 | 25 | 60 | Knobs, Cracks |
| A080437-7 | 400 | 184 | 65 | 0 | 64 | Cracks |
| A080570-10 | 388 | 272 | 96 | 0 | 66 | |
| A080576-5 | 250 | 137 | 49 | 2 | 74 | Deep eyes |
| A080592-1 | 443 | 350 | 124 | 6 | 75 | |
| C008014-1 | 407 | 350 | 124 | 34 | 69 | |
| C008018-3 | 301 | 208 | 74 | 11 | 64 | |
| ND388-1 | 254 | 193 | 68 | 19 | 77 | |
| ND534-4 | 257 | 206 | 73 | 16 | 64 | |
| NDA1309-6 | 293 | 190 | 67 | 31 | 70 | Knobs |
| Lemhi | 415 | 332 | 118 | 12 | 75 | |
| Nooksack | 355 | 305 | 108 | 2 | 77 | |
| Norgold R. | 413 | 367 | 130 | 53 | 69 | |
| R. Burbank | 397 | 282 | 100 | 33 | 77 | Rough |

^{1/} H.H. = hollow heart

^{2/} 1.0 omitted

Oregon Table 3. Yield and grade-out of Statewide Potato Variety Trial entries at Ontario, 1985.

| Variety | Yield, cwt/A | | No. 1 % R.B. |
|------------|--------------|------------|-----------------|
| | Total | U.S. No. 1 | |
| A7411-2 | 467 | 370 | 96 |
| A74212-1 | 730 | 578 | 150 |
| A7869-5 | 454 | 390 | 101 |
| A7919-1 | 660 | 571 | 148 |
| A7987-14 | 554 | 475 | 123 |
| A7914103 | 589 | 520 | 135 |
| A079492-2 | 642 | 596 | 155 |
| A08035-3 | 573 | 518 | 134 |
| A08035-8 | 361 | 341 | 89 |
| A08036-6 | 475 | 383 | 99 |
| A08036-18 | 436 | 420 | 109 |
| A08037-12 | 425 | 318 | 83 |
| A08096-10 | 515 | 479 | 124 |
| A080432-1 | 440 | 415 | 108 |
| A080432-7 | 549 | 532 | 138 |
| A080437-6 | 531 | 434 | 113 |
| A080437-7 | 485 | 431 | 112 |
| A080570-10 | 606 | 546 | 142 |
| A080576-5 | 449 | 423 | 110 |
| A080592-1 | 494 | 443 | 115 |
| C008014-1 | 598 | 550 | 143 |
| C008018-3 | 462 | 379 | 98 |
| ND388-1 | 641 | 519 | 135 |
| ND534-4 | 659 | 502 | 130 |
| NDA1309-6 | 437 | 427 | 111 |
| Lemhi R. | 487 | 449 | 117 |
| Norgold R. | 441 | 427 | 111 |
| R. Burbank | 580 | 385 | 100 |
| LSD, .05 | 131 | 114 | - |

Oregon Table 4. Yield, grade, fry color, and tuber characteristics of Statewide Potato Variety Trial entries at Powell Butte, 1985.

| Variety | Yield, cwt/A | | % R.B. | Spec. ^{1/} Grav. | Fry ^{2/} Color | Percent | | |
|------------|--------------|------------|--------|------------------------------|----------------------------|---------|------|--------------------|
| | Total | U.S. No. 1 | | | | H.H. | B.S. | B.C. ^{3/} |
| A7411-2 | 489 | 285 | 91 | 84 | 2.50 | 0 | 0 | 0 |
| A74212-1 | 528 | 396 | 127 | 83 | 3.50 | 0 | 9 | 0 |
| A7869-5 | 456 | 322 | 103 | 84 | 2.70 | 0 | 3 | 0 |
| A7919-1 | 539 | 333 | 107 | 90 | 2.50 | 4 | 3 | 2 |
| A7987-14 | 416 | 317 | 102 | 84 | 2.69 | 0 | 6 | 0 |
| A79141-3 | 328 | 193 | 62 | 89 | 1.94 | 8 | 0 | 0 |
| A079492-2 | 565 | 421 | 135 | 79 | 2.61 | 2 | 4 | 0 |
| A08035-3 | 422 | 248 | 79 | 82 | 3.94 | 2 | 0 | 0 |
| A08035-8 | 390 | 242 | 78 | 80 | 2.50 | 0 | 0 | 0 |
| A08036-6 | 448 | 309 | 99 | 78 | 1.72 | 0 | 3 | 2 |
| A0836-18 | 484 | 336 | 108 | 74 | 2.24 | 0 | 4 | 0 |
| A08037-12 | 433 | 315 | 101 | 74 | 2.25 | 0 | 4 | 0 |
| A08096-10 | 441 | 308 | 99 | 95 | 2.94 | 0 | 2 | 0 |
| A080432-1 | 400 | 246 | 79 | 82 | 2.10 | 2 | 5 | 2 |
| A080432-7 | 412 | 259 | 83 | 85 | 3.06 | 2 | 2 | 0 |
| A080437-6 | 451 | 211 | 68 | 76 | 3.63 | 3 | 0 | 0 |
| A080437-7 | 490 | 206 | 66 | 83 | 3.44 | 0 | 0 | 0 |
| A080570-10 | 483 | 276 | 88 | 79 | 3.35 | 0 | 0 | 0 |
| A080576-5 | 424 | 287 | 92 | 81 | 2.58 | 0 | 11 | 0 |
| A080592-1 | 457 | 243 | 78 | 89 | 3.00 | 24 | 0 | 2 |
| C008014-1 | 428 | 307 | 98 | 89 | 1.13 | 4 | 2 | 0 |
| C008018-3 | 326 | 181 | 58 | 81 | 1.50 | 6 | 4 | 0 |
| ND388-1 | 323 | 232 | 74 | 90 | 1.63 | 3 | 2 | 8 |
| ND534-4 | 373 | 272 | 87 | 70 | 3.06 | 2 | 6 | 0 |
| NDA1309-6 | 434 | 272 | 87 | 93 | 2.99 | 0 | 4 | 7 |
| Lemhi R. | 469 | 273 | 88 | 92 | 2.91 | 4 | 25 | 0 |
| Norgold R. | 432 | 299 | 96 | 78 | 3.33 | 21 | 0 | 0 |
| R. Burbank | 489 | 312 | 100 | 88 | 2.25 | 3 | 2 | 18 |
| LSD 5% | 89 | - | - | - | 0.91 | 7 | 6 | 6 |

^{1/} 1.0 omitted

^{2/} Low numbers = light color

^{3/} H.H. = hollow heart, B.S. = black spot, B.C. = brown center

Oregon Table 5. Average yield of Statewide Potato Variety Trial entries at four locations, 1985.

| Variety | Avg. yield, cwt/A | | % R.B. |
|------------|-------------------|------------|--------|
| | Total | U.S. No. 1 | |
| A7411-2 | 472 | 327 | 86 |
| A74212-1 | 676 | 543 | 144 |
| A7869-5 | 512 | 411 | 109 |
| A7919-1 | 581 | 457 | 121 |
| A7987-14 | 502 | 399 | 106 |
| A79141-3 | 484 | 366 | 97 |
| A079492-2 | 606 | 502 | 133 |
| A08035-3 | 488 | 382 | 101 |
| A08035-8 | 357 | 256 | 68 |
| A08036-6 | 456 | 353 | 93 |
| A08036-18 | 456 | 367 | 97 |
| A08037-12 | 440 | 288 | 76 |
| A08096-10 | 482 | 381 | 101 |
| A080432-1 | 399 | 317 | 84 |
| A080432-7 | 512 | 396 | 105 |
| A080437-6 | 538 | 384 | 102 |
| A080437-7 | 463 | 305 | 81 |
| A080570-10 | 530 | 396 | 105 |
| A080576-5 | 404 | 306 | 81 |
| A080592-1 | 515 | 401 | 106 |
| C008014-1 | 549 | 458 | 121 |
| C008018-3 | 382 | 277 | 73 |
| ND534-4 | 413 | 321 | 85 |
| NDA1309-6 | 425 | 339 | 90 |
| Lemhi R. | 496 | 399 | 106 |
| Norgold R. | 427 | 359 | 95 |
| R. Burbank | 557 | 378 | 100 |

Oregon Table 6. Performance of Western Regional Trial entries at Hermiston, 1985.

| Variety | 111 Days | | 157 Days | | | | | |
|------------|--------------|------------|--------------|------------|--------------------------|----------------------------|------------------|--------------------------|
| | Yield, cwt/A | | Yield, cwt/A | | Sp. ^{1/} Gr. | Fry ^{2/} Color | Sugar Ends, % | I.D., ^{3/} % |
| | Total | U.S. No. 1 | Total | U.S. No. 1 | | | | |
| R. Burbank | 298 | 168 | 726 | 484 | 77 | 1.13 | 39 | 15.0 |
| Lemhi | 295 | 226 | 611 | 564 | 90 | 0.22 | 16 | 67.0 |
| Norgold | 363 | 311 | 731 | 606 | 68 | 2.64 | 10 | 23.0 |
| A7411-2 | 282 | 224 | 662 | 532 | 87 | 1.12 | 15 | 24.0 |
| A74114-4 | 495 | 367 | 747 | 695 | 79 | 2.79 | 55 | 10.0 |
| A76147-2 | 367 | 333 | 769 | 586 | 69 | 2.13 | 13 | 20.0 |
| AC77513-1 | 238 | 190 | 578 | 512 | 84 | 2.75 | 7 | 26.0 |
| AC77652-1 | 185 | 129 | 684 | 586 | 68 | 2.92 | 48 | 25.0 |
| ND388-1 | 288 | 231 | 499 | 433 | 69 | 2.26 | 6 | 26.0 |
| ND534-4 | 283 | 227 | 696 | 594 | 64 | 2.74 | 12 | 17.3 |
| TC582-1 | 156 | 95 | 386 | 341 | 88 | 0.22 | 0 | 9.0 |

^{1/} Determined by air/water method

^{2/} Low numbers indicate light color

^{3/} Total internal defects including hollow heart, brown center, internal brown spot, black spot, and vascular discoloration

Oregon Table 7. Performance of sixteen potato varieties at Corvallis, 1985.

| Variety | Yield, Cwt/A | | Percent | | | oz/ Tuber | Specific ^{1/} Gravity | Chip ^{2/} Color | NO ₃ -N, ppm ^{3/} x 10,000 |
|------------|--------------|-----|---------|-----|-------|--------------|-----------------------------------|-----------------------------|---|
| | Total | Mkt | Mkt | <2" | Culls | | | | |
| Denali | 671 | 515 | 78 | 5 | 18 | 8.4 | 99 | 8.0 | 2.30 |
| Rosa | 635 | 547 | 86 | 7 | 7 | 7.0 | 93 | 4.0 | 1.85 |
| Norchip | 544 | 467 | 86 | 9 | 6 | 5.9 | 88 | 4.0 | 2.59 |
| A74212-1 | 715 | 489 | 69 | 6 | 25 | 10.1 | 90 | - | 2.50 |
| ND860-2 | 466 | 405 | 87 | 11 | 2 | 6.5 | 86 | 2.5 | 1.67 |
| ND671-4 | 467 | 396 | 84 | 11 | 5 | 7.8 | 77 | - | 2.01 |
| ND398-1 | 521 | 440 | 84 | 12 | 4 | 5.8 | 83 | 4.5 | 2.59 |
| Norgold | 452 | 389 | 86 | 10 | 4 | 6.4 | 79 | - | 2.18 |
| Barlow | 367 | 258 | 71 | 19 | 10 | 5.7 | 90 | - | 3.61 |
| Crystal | 614 | 534 | 87 | 7 | 6 | 6.2 | 86 | 5.5 | 2.34 |
| Rideau | 571 | 528 | 93 | 2 | 5 | 8.9 | 84 | - | 3.11 |
| Bintje | 720 | 508 | 71 | 17 | 12 | 4.9 | 88 | - | 2.45 |
| Sangre | 577 | 493 | 85 | 11 | 4 | 6.4 | 77 | - | 2.46 |
| R. Burbank | 559 | 251 | 44 | 29 | 36 | 6.7 | 90 | - | 2.18 |
| ND388-1 | 414 | 323 | 78 | 7 | 15 | 9.7 | 90 | - | 2.68 |
| ND534-4 | 354 | 313 | 88 | 8 | 4 | 9.1 | 79 | - | 2.83 |
| LSD, .05 | 123 | 130 | 11 | 5 | 10 | 1.9 | 5 | - | - |

^{1/} 1.0 omitted

^{2/} Fried on December 12. Low number = light color

^{3/} Petiole NO₃-N levels on July 12

TEXAS

J. Creighton Miller, Jr. and Douglas G. Smallwood

Variety Development and Testing

Seedling Program. Approximately 37,000 first-year seedlings, representing 329 families were grown for selection near Hereford in 1985, and 99 original selections were made from this material. The 1985 first-year seedlings from Texas resulted from crosses made at the Texas Agricultural Experiment Station near Lubbock during the winter of 1983-84. The remainder were obtained from Joe Pavcek in Idaho (10,302), Bob Johansen in North Dakota (10,107) and Florian Lauer in Minnesota (3000). The Texas program also supplied the North Dakota, Idaho, and Colorado programs with second, third, and fourth sized seedling tubers for selection.

Adaptation Trials. The variety and advanced selection trials at Olton were planted on April 6 and harvested on August 28. In general, yields were good. The performance of the check variety, Norgold "M" was outstanding (Table 1). Additional outstanding russet entries included: AC 77149-2, ATX 9-77255-7 Ru, TX 9-652-10 Ru, NDTX 9-1069-4 Ru, NorKing, Krantz, TX 9-655-20 Ru and Mn 10874. Although A 74212-1 had the highest yield and large tubers, it had poor shape and received a low general rating. The outstanding white entries (Table 2) were: A 7914-33 and Denali #19. Red LaSoda was the highest yielding red entry. The advanced selection, NDTX 9-1068-11 R, continues to look exceptionally good and is being considered for release in the near future. Although Viking had a nice tuber type, the yield was somewhat low as was the case with NDTX 8-731-1 R. Reddale had good tuber type, but yields were low compared to previous years.

The strip trial at Olton (Table 3) consisted of 9 of our most promising selections for which sufficient seed supplies were available for strip planting of 600 foot rows. Five randomly selected plots were harvested for each entry. Krantz, Norgold "M" and Red LaSoda were used as check varieties. The outstanding entry in this trial was TC 582-1 which outyielded the check varieties Norgold "M" and Krantz. The average tuber weight of TC 582-1 was not as large as that of Norgold "M", but it produced a larger proportion of tubers in the greater-than-8-ounce range that were of uniform size. In addition, its specific gravity was extremely high and it is not as susceptible to hollow heart as Norgold "M". However, it is very late. The selection NDTX 9-1068-11 R produced comparable yields to Red LaSoda. This selection retains its bright red color and does not have the deep eyes which are typical of Red LaSoda. These two selections hold the greatest promise for release as new varieties.

Advanced selections from various breeding programs were tested under Texas conditions (Table 4). The advanced selection A 74212-1 and check variety Norgold "M" produced total yields which were significantly higher than all other entries. Other selections deserving mention include: W 451-2, ND 770-4 Ru and A 7265-2.

A number of Norgold Russet strains, as well as Norgold Russet were tested at Olton (Table 5). Norgold "M" and Norgold #19 were the outstanding entries based on yield and general rating. Cracks and/or second growth were apparent with Norgold #35 and Norgold #40. Norgold #11 exhibited nice tuber type. Norgold "M" continues to perform at a consistent and superior level from year to year.

Summarizing the results from all trials at Olton, the most promising entries were NDTX 9-1068-11 R and TC 582-1. There was, again, inconsistency in performance of the Norgold Russet strains. This is a continuing concern. In general, most strains outperformed regular Norgold Russet, especially on sandy soils at Olton, and Norgold "M" has been the most consistent performer.

Texas Table 1. Total yield, percent of total weight over 4 ounces, average tuber weight of 8 ounces plus grade, average weight per tuber in ounces, vigor, maturity, and general rating of 30 potato varieties or selections grown at Olton, Texas - 1985.

| Variety or Selection | Total Yield CWT/A. | Percent by Wt. Over 4 oz. | Average Tuber Wt. of 8 oz.+ Grade | Average Weight/ Tuber in oz. | Vigor ^{1/} | Maturity ^{2/} | General ^{3/} Rating |
|----------------------------|--------------------------|------------------------------------|--|---------------------------------------|---------------------|------------------------|---------------------------------|
| A 74212-1 | 417.8 | 92.5 | 13.4 | 7.7 | 4.0 | 2.0 | 1.6 |
| Mn 12161 | 409.4 | 59.1 | 10.5 | 2.8 | 5.0 | 3.0 | 1.0 |
| TX 9-646-6 Ru | 401.3 | 96.9 | 14.5 | 10.7 | 4.0 | 2.6 | 3.0 |
| Norgold "M" | 394.6 | 91.9 | 13.5 | 7.6 | 3.3 | 4.0 | 3.6 |
| TX 9-652-10 Ru | 385.6 | 88.0 | 11.5 | 6.1 | 3.8 | 4.5 | 2.6 |
| A 71.72-1 | 383.6 | 88.2 | 11.6 | 6.2 | 3.6 | 3.8 | 1.3 |
| AC 77149-2 | 356.3 | 87.9 | 11.1 | 6.2 | 3.9 | 4.0 | 3.3 |
| BC 9668-1 | 349.6 | 86.4 | 10.6 | 5.7 | 4.0 | 3.9 | 3.3 |
| ATX 9-77255-7 Ru | 335.7 | 94.9 | 13.7 | 8.1 | 2.9 | 4.6 | 3.0 |
| TX 9-649-9 Ru | 334.8 | 96.1 | 13.1 | 9.6 | 3.4 | 3.5 | 3.0 |
| TX 9-652-10 Ru | 320.8 | 97.1 | 12.8 | 9.3 | 3.9 | 3.6 | 3.3 |
| A 26.72-2 | 314.7 | 80.2 | 10.4 | 4.5 | 3.9 | 3.0 | 1.0 |
| B 9540-62 | 288.9 | 94.4 | 11.0 | 6.1 | 3.5 | 3.9 | 2.0 |
| ND 671-4 Ru | 261.9 | 83.0 | 8.4 | 5.3 | 3.1 | 4.7 | 2.0 |
| NDTX 9-1069-4 Ru | 260.1 | 88.6 | 10.6 | 6.1 | 3.3 | 4.7 | 3.0 |
| ATX 6-74198-1 Ru | 257.0 | 82.7 | 11.3 | 5.2 | 2.7 | 4.6 | 2.0 |
| NorKing | 256.4 | 88.8 | 10.6 | 5.8 | 3.1 | 4.5 | 2.6 |
| ATX 9-77255-7 Ru | 249.1 | 89.0 | 12.6 | 5.8 | 2.9 | 4.5 | 2.6 |
| Mn 12171 | 246.5 | 86.9 | 10.6 | 3.8 | 3.0 | 5.0 | 1.0 |
| Krantz (CO) | 235.2 | 93.0 | 12.0 | 7.2 | 2.8 | 4.7 | 3.6 |
| TX 9-655-20 Ru | 227.3 | 90.3 | 10.7 | 6.3 | 2.9 | 4.6 | 3.0 |
| NDTX 8-666-1 Ru | 218.6 | 84.8 | 11.2 | 5.5 | 3.0 | 4.8 | 2.5 |
| Krantz (TX) | 215.7 | 82.8 | 14.7 | 5.7 | 2.3 | 3.9 | 1.6 |
| Norgold Russet | 210.5 | 82.6 | 10.6 | 5.5 | 2.9 | 4.7 | 2.3 |

Continued

Texas Table 1. Continued.

| Variety or Selection | Total Yield CWT/A. | Percent by Wt. Over 4 oz. | Average Tuber Wt. of 8 oz.+ Grade | Average Weight/ Tuber in oz. | Vigor ^{1/} | Maturity ^{2/} | General ^{3/} Rating |
|----------------------------|--------------------------|------------------------------------|--|---------------------------------------|---------------------|------------------------|---------------------------------|
| Mn 10874 | 205.6 | 94.0 | 11.5 | 6.6 | 3.0 | 3.5 | 4.0 |
| Mn 12482 | 190.7 | 74.4 | 0.0 | 3.5 | 2.5 | 5.0 | 1.0 |
| TX 9-655-20 Ru | 190.3 | 89.6 | 12.4 | 6.2 | 2.2 | 4.7 | 2.0 |
| ND 800-4 Ru | 178.8 | 71.2 | 8.9 | 3.7 | 2.4 | 4.6 | 1.0 |
| Mn 11795 | 177.7 | 44.1 | 20.2 | 2.7 | 1.6 | 4.7 | 1.0 |
| ND 1113-10 Ru | 173.6 | 74.7 | 9.3 | 4.1 | 3.6 | 3.8 | 1.5 |
| Krantz (Mn) | 168.1 | 87.5 | 6.8 | 4.8 | 3.0 | 3.8 | 3.0 |
| Mn 12465 | 166.3 | 70.1 | 12.0 | 3.7 | 2.8 | 5.0 | 1.0 |
| Mn 11816 | 128.9 | 82.4 | 10.9 | 4.7 | 2.0 | 5.0 | 2.0 |
| Average | 270.0 | 84.7 | 11.7 | 5.8 | 3.2 | 4.2 | 2.2 |
| LSD (.05) | 70.7 | 6.4 | 3.2 | 1.3 | | | |

^{1/} 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

^{2/} 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

^{3/} 1 = very poor to 5 = excellent

Texas Table 2. Total yield, percent of total weight over 4 ounces, average tuber weight of 8 ounces plus grade, average weight per tuber in ounces, vigor, maturity, and general rating of 36 red and white skin potato varieties or selections grown at Olton, Texas - 1985.

| Variety or Selection | Total Yield CWT/A. | Percent by Wt. Over 4 oz. | Average Tuber Wt. of 8 oz.+ Grade | Average Weight/ Tuber in oz. | Vigor ^{1/} | Maturity ^{2/} | General ^{3/} Rating |
|----------------------------|--------------------------|------------------------------------|--|---------------------------------------|---------------------|------------------------|---------------------------------|
| A 7914-33 | 563.9 | 92.1 | 12.1 | 7.3 | 4.5 | 1.5 | 3.0 |
| Red LaSoda | 495.1 | 94.8 | 12.5 | 10.1 | 3.8 | 3.9 | 4.0 |
| A 172.69-1 | 357.1 | 88.2 | 10.8 | 5.0 | 3.9 | 3.7 | 3.0 |
| Mn 83040 | 347.6 | 55.3 | 8.1 | 2.8 | 3.8 | 2.8 | 1.0 |
| BN 9820-3 W | 336.7 | 75.0 | 13.2 | 9.5 | 3.5 | 4.7 | 3.0 |
| Denali #19 | 336.2 | 89.7 | 10.2 | 6.4 | 3.6 | 3.5 | 3.3 |
| NDTX 9-1068-11 R | 332.7 | 96.2 | 13.9 | 8.9 | 3.2 | 4.6 | 3.5 |
| A 9.72-1 | 329.6 | 93.4 | 12.3 | 6.6 | 3.6 | 4.7 | 3.0 |
| Mn 11373 | 292.7 | 75.0 | 10.1 | 4.1 | 3.0 | 4.0 | 1.0 |
| Dark Red Norland #13 | 290.1 | 85.3 | 12.7 | 5.7 | 3.5 | 4.7 | 2.6 |
| Red LaSoda #10 | 289.8 | 86.9 | 12.1 | 7.1 | 2.5 | 4.8 | 3.0 |
| Red Sport Viking | 285.4 | 91.8 | 12.8 | 6.9 | 2.9 | 3.8 | 2.6 |
| Sangre | 283.4 | 86.9 | 12.2 | 5.7 | 3.6 | 4.5 | 2.6 |
| Red LaSoda #5 | 270.6 | 90.4 | 14.0 | 6.5 | 3.1 | 4.6 | 2.3 |
| Atlantic | 268.3 | 89.6 | 11.5 | 3.8 | 3.1 | 4.3 | 1.6 |
| Reddale | 267.1 | 92.1 | 10.6 | 6.7 | 2.6 | 4.5 | 3.3 |
| NE 79-R | 266.1 | 78.3 | 14.1 | 4.3 | 3.5 | 4.7 | 1.0 |
| NDTX 8-731-1 R | 264.8 | 92.4 | 10.5 | 6.2 | 2.5 | 5.0 | 4.0 |
| ND 1183-2 | 249.7 | 79.3 | 11.5 | 4.7 | 2.6 | 4.7 | 1.3 |
| Alasclear | 249.4 | 87.7 | 12.8 | 6.3 | 3.4 | 4.5 | 1.3 |
| Viking | 234.6 | 90.5 | 12.3 | 7.2 | 2.8 | 4.6 | 3.3 |
| TXA 218-7 | 222.4 | 92.1 | 10.9 | 6.4 | 3.0 | 4.7 | 2.3 |
| New Norchip | 214.8 | 82.3 | 12.3 | 5.1 | 3.1 | 4.0 | 1.6 |
| BN 9803-1 | 212.2 | 76.6 | 11.0 | 4.5 | 2.9 | 4.6 | 1.6 |

Continued

Texas Table 2. Continued.

| Variety or Selection | Total Yield CWT/A. | Percent by Wt. Over 4 oz. | Average Tuber Wt. of 8 oz.+ Grade | Average Weight/ Tuber in oz. | Vigor ^{1/} | Maturity ^{2/} | General ^{3/} Rating |
|----------------------------|--------------------------|------------------------------------|--|---------------------------------------|---------------------|------------------------|---------------------------------|
| ND 1323-1 | 202.9 | 84.3 | 12.1 | 5.1 | 2.7 | 4.5 | 1.0 |
| Mn 10162 | 195.1 | 80.3 | 11.9 | 5.9 | 3.5 | 3.8 | 1.0 |
| ND 678-8 | 189.3 | 77.8 | 10.6 | 3.8 | 2.8 | 4.6 | 1.3 |
| Red Norland | 186.7 | 81.9 | 11.4 | 4.5 | 2.4 | 4.7 | 1.6 |
| Mn 8742 | 179.4 | 89.3 | 13.4 | 5.4 | 2.0 | 4.5 | 3.0 |
| Tolaas | 177.7 | 85.6 | 12.0 | 5.4 | 2.5 | 4.6 | 1.0 |
| BN 9855-2 W | 170.3 | 84.0 | 13.8 | 6.0 | 3.2 | 3.0 | 1.0 |
| Mn 11903 | 157.6 | 81.7 | 9.3 | 4.1 | 1.8 | 5.0 | 2.0 |
| Erik | 133.2 | 49.0 | 16.0 | 2.7 | 3.0 | 5.0 | 2.0 |
| ND 1196-2 R | 122.2 | 33.2 | 0.0 | 2.5 | 2.4 | 3.6 | 1.0 |
| Mn 11705 | 92.3 | 53.7 | 0.0 | 3.2 | 1.8 | 5.0 | 1.0 |
| Mn 82328 | 61.8 | 50.7 | 9.0 | 2.5 | 1.8 | 3.0 | 1.0 |
| Average | 253.6 | 80.9 | 11.9 | 5.7 | 2.4 | 3.0 | 2.1 |
| LSD (.05) | 78.3 | 9.4 | 2.9 | 1.8 | | | |

^{1/} 1 = very poor, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

^{2/} 1 = very late, 3 = medium, 4 = early, 5 = very early

^{3/} 1 = very poor to 5 = excellent

Texas Table 3. Total yield, percent of total weight over 4 ounces, average tuber weight of 8 ounces plus grade, average weight per tuber in ounces, specific gravity, tuber type and skin type of 9 advanced selections and 3 check varieties of potatoes grown in a strip trial at Olton, Texas - 1985.

| Selection or Check Variety | Total Yield CWT/A. | Percent by Wt. Over 4 oz. | Average Tuber Wt. of 8 oz.+ Grade | Average Tuber Weight/ in oz. | Specific Gravity | Tuber Type | Skin Type |
|----------------------------------|--------------------------|------------------------------------|--|---------------------------------------|---------------------|---------------|--------------|
| Red LaSoda | 387.7 | 85.7 | 8.3 | 6.6 | 1.061 | Oblong | Red |
| TC 582-1 | 368.0 | 93.2 | 10.4 | 7.6 | 1.072 | Long | Russet |
| TX 9-646-6 Ru | 352.0 | 95.3 | 13.0 | 10.5 | 1.058 | Round | Russet |
| NDTX 9-1068-11 R | 342.2 | 92.3 | 9.7 | 7.0 | 1.060 | Oblong | Red |
| Norgold "M" | 259.0 | 85.7 | 11.1 | 6.9 | 1.057 | Long | Russet |
| Krantz | 213.4 | 83.0 | 9.3 | 5.8 | 1.058 | Oblong | Russet |
| TXA 218-7 | 209.8 | 86.0 | 9.6 | 6.5 | 1.060 | Long | Red |
| ATX 9-7738-9 Ru | 196.4 | 84.4 | 9.8 | 5.9 | 1.063 | Long | Russet |
| TX 9-649-9 Ru | 195.6 | 91.3 | 10.7 | 7.4 | 1.053 | Oblong | Russet |
| ATX 9-77255-7 Ru | 191.2 | 69.9 | 9.2 | 4.9 | 1.067 | Long | Russet |
| ATX 9-7738-8 Ru | 161.0 | 78.2 | 9.7 | 5.2 | 1.062 | Long | Russet |
| TX 9-646-4 Ru | 148.0 | 90.0 | 10.2 | 7.0 | 1.059 | Oblong | Russet |
| Average | 252.0 | 86.3 | 10.1 | 6.8 | 1.061 | | |
| LSD (.05) | 64.5 | 8.9 | 2.2 | 1.6 | | | |

Texas Table 4. Total yield, percent of total weight over 4 ounces, average tuber weight of 8 ounces plus grade, average weight per tuber in ounces, vigor, maturity, and general rating of 26 advanced selections from various breeding programs (Texas seed) and 3 check varieties of potatoes grown at Olton, Texas. 1985.

| Variety or Selection | Total Yield CWT/A. | Percent by Wt. Over 4 oz. | Average Tuber Wt. of 8 oz.+ Grade | Average Weight/ Tuber in oz. | Vigor ^{1/} | Maturity ^{2/} | General ^{3/} Rating |
|----------------------------|--------------------------|------------------------------------|--|---------------------------------------|---------------------|------------------------|---------------------------------|
| A 74212-1 | 444.8 | 90.0 | 12.5 | 10.7 | 3.7 | 2.8 | 3.0 |
| Norgold "M" | 389.4 | 91.0 | 12.7 | 7.7 | 3.5 | 4.1 | 4.0 |
| A 7265-2 | 279.2 | 83.6 | 12.3 | 5.8 | 3.8 | 2.8 | 2.5 |
| Mn 82423 | 266.0 | 66.6 | 8.4 | 4.0 | 4.0 | 2.1 | 1.5 |
| Mn 10162 | 262.8 | 83.3 | 10.8 | 6.1 | 3.5 | 4.0 | 1.0 |
| Norgold Russet | 245.3 | 80.8 | 10.6 | 5.2 | 3.2 | 4.8 | 3.5 |
| A 7411-2 | 243.0 | 83.4 | 11.1 | 6.0 | 3.3 | 3.0 | 1.5 |
| A 74133-1 | 237.2 | 76.0 | 11.0 | 5.1 | 3.9 | 2.1 | 3.0 |
| AC 77652-1 | 237.2 | 85.5 | 12.2 | 7.2 | 3.7 | 4.0 | 3.5 |
| A 71.72-1 | 220.7 | 78.7 | 12.4 | 4.9 | 3.1 | 3.6 | 2.0 |
| Mn 10874 | 218.9 | 76.6 | 11.1 | 4.8 | 3.0 | 4.8 | 3.0 |
| Mn 11373 | 213.4 | 65.0 | 10.4 | 4.2 | 3.1 | 4.7 | 1.0 |
| A 74595-11 | 200.3 | 78.6 | 11.3 | 5.0 | 3.5 | 3.5 | 3.5 |
| A 71.72-1 | 197.1 | 82.1 | 12.4 | 5.7 | 3.5 | 4.1 | 2.5 |
| Mn 11753 | 187.0 | 60.3 | 8.9 | 3.4 | 3.1 | 4.6 | 1.5 |
| A 74595-11 | 200.3 | 78.6 | 11.3 | 5.2 | 2.9 | 4.6 | 3.5 |
| A 63-71-1 | 185.8 | 79.0 | 11.2 | 5.2 | 3.6 | 3.5 | 3.0 |
| ND 321-1 Ru | 178.8 | 73.7 | 10.9 | 6.4 | 3.1 | 4.5 | 2.5 |
| A 69.72-2 | 166.9 | 86.5 | 11.9 | 6.7 | 3.3 | 4.6 | 2.0 |
| ND 1113-10 Ru | 163.7 | 66.4 | 8.6 | 3.9 | 2.8 | 4.6 | 2.5 |
| NR 7003-2 Ru | 154.2 | 64.3 | 8.6 | 3.8 | 2.9 | 4.7 | 2.0 |
| Mn 12161 | 150.7 | 67.4 | 9.5 | 4.0 | 3.0 | 3.9 | 2.0 |
| NorKing | 150.7 | 63.8 | 9.1 | 3.9 | 2.6 | 4.8 | 2.0 |

Continued

Texas Table 4. Continued.

| Variety or Selection | Total Yield CWT/A. | Percent by Wt. Over 4 oz. | Average Tuber Wt. of 8 oz.+ Grade | Average Weight/ Tuber in oz. | Vigor ^{1/} | Maturity ^{2/} | General ^{3/} Rating |
|----------------------------|--------------------------|------------------------------------|--|---------------------------------------|---------------------|------------------------|---------------------------------|
| ND 770-4 Ru | 148.6 | 81.4 | 10.7 | 6.1 | 3.5 | 3.8 | 3.5 |
| 78-LC1 | 126.9 | 55.5 | 10.1 | 3.4 | 2.6 | 3.8 | 2.5 |
| A 74114-4 | 122.8 | 66.3 | 9.3 | 3.7 | 1.4 | 4.6 | 1.5 |
| B 8943-4 Ru | 99.6 | 63.6 | 9.0 | 3.8 | 2.6 | 4.6 | 2.0 |
| Mn 11705 | 91.9 | 34.6 | 0.0 | 2.4 | 2.2 | 4.9 | 2.0 |
| Mn 11705 | 87.5 | 52.9 | 0.0 | 2.8 | 2.0 | 4.9 | 1.0 |
| Average | 199.9 | 73.1 | 10.6 | 5.0 | 3.0 | 4.0 | 2.4 |
| LSD(.05) | 79.0 | 11.1 | 2.0 | 2.6 | | | |

^{1/} 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

^{2/} 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

^{1/} 1 = very poor to 5 = excellent

Texas Table 5. Total yield, percent of total weight over 4 ounces, average tuber weight of 8 ounces plus grade, average weight per tuber in ounces, vigor, maturity, and general rating of 10 Norgold Russet strains, as well as Norgold Russet grown at Olton, Texas - 1985.

| Variety or Selection | Total Yield CWT/A. | Percent by Wt. Over 4 oz. | Average Tuber Wt. of 8 oz.+ Grade | Average Weight/ Tuber in oz. | Vigor ^{1/} | Maturity ^{2/} | General ^{3/} Rating |
|----------------------------|--------------------------|------------------------------------|--|---------------------------------------|---------------------|------------------------|---------------------------------|
| Norgold #19 | 356.3 | 91.1 | 11.8 | 7.0 | 3.7 | 3.3 | 3.3 |
| Norgold "M"(TAES Ck) | 344.1 | 90.8 | 11.8 | 7.1 | 3.5 | 4.1 | 3.3 |
| Norgold #40 | 337.4 | 89.3 | 11.4 | 6.7 | 3.9 | 2.9 | 3.0 |
| Norgold "M"(Neb) | 320.6 | 90.6 | 10.8 | 6.6 | 3.5 | 4.1 | 3.3 |
| Norgold #35 | 298.2 | 87.7 | 10.9 | 6.0 | 3.3 | 3.6 | 3.0 |
| Norgold #12 | 294.4 | 90.3 | 10.4 | 6.0 | 3.5 | 4.3 | 3.0 |
| Norgold #11 | 293.0 | 87.3 | 10.5 | 5.9 | 3.1 | 4.7 | 3.0 |
| Norgold #10-7 | 271.5 | 87.3 | 11.4 | 6.2 | 3.3 | 4.6 | 2.6 |
| Super NR (Jorde) | 230.8 | 84.9 | 8.3 | 4.5 | 2.7 | 4.6 | 2.6 |
| NR 7003-2 | 219.5 | 88.1 | 9.1 | 4.7 | 3.0 | 4.6 | 2.0 |
| Super NR (Shaver) | 210.5 | 76.5 | 9.4 | 3.6 | 2.3 | 4.7 | 1.6 |
| Norgold Russet | 187.3 | 78.0 | 9.6 | 4.0 | 2.5 | 4.6 | 1.3 |
| Average | 280.3 | 86.8 | 10.4 | 5.7 | 3.2 | 4.2 | 2.6 |
| LSD (.05) | 72.5 | 6.0 | 1.7 | 1.0 | | | |

^{1/} 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous

^{2/} 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early

^{3/} 1 = very poor to 5 = excellent

VIRGINIA

S. B. Sterrett and C. P. Savage, Jr.

| | |
|-----------------------|---|
| Purpose | A total of 11 named varieties and 54 numbered selections were grown in replicated yield trials to evaluate for regional adaptation and tuber quality. An additional 23 selections were evaluated in observational trials. |
| Procedures | Trials were planted as a randomized complete block design, with 4 replications in advanced trials and 2 replications in observational trials. For all trials, single row plots were planted in rows 36" apart, 12" between seed pieces. Fertilization included 100 lbs N, 43.7 lbs P, and 83 lbs K/A banded at planting on a Norfolk sandy loam on March 14. An additional 50 lbs N was sidedressed on May 28. Metribuzin (0.5 lbs ai/A) was applied at drag-off. All plots were harvested July 8, 1985. |
| Seasonal observations | Favorable weather conditions resulted in quick, uniform emergence and nearly perfect plant stands. Supplemental irrigation reduced moisture stress in early May. The improved yield in these trials over those of the past two years reflects the record 200 cwt/A average yield recorded for Virginia in 1985 (Va. Crop Reporting Service, Va. Dept. of Ag.). Although the development of heat necrosis was a problem commercially in 'Atlantic' harvested in late July, very little evidence of this disorder was recorded in these trials. Sunburn was the most common external tuber defect. |
| Promising clones | <p><u>Round White</u>: Numerous selections exceeded Superior in marketable yield. Those combining improved yield with desirable tuber shape, size, set, and appearance include B 9581-10, B 9792-8B, B 9792-27B, B 9792-54, B 9792-136, B 9792-158, B 9955-46, and NY 81. With the exception of B 9581-10, B 9792-8B, and NY 81, all had acceptable chip color for 14 days after harvest. Because of the improved yields and exceptional tuber qualities, the selections B 9581-10 and NY 81 may have potential as fresh market varieties. Susceptibility to scab of B 9792-27B and lower specific gravity of B 9792-136 and B 9755-46 may limit interest in these lines. The exceptionally high yields recorded for LaChipper could be attributed, in part, to the lower incidence of foliar injury caused by air pollution than recorded in previous years.</p> <p><u>Russet</u>: Several selections exceeded BelRus in total yield and in percent large tubers, including B 9540-62 (NemaRus), B 9882-14, B 9882-15, B 9940-1, and B 0060-112. However, with the possible exception of B 9540-62, inconsistent and/or irregular shape and appearance are excessive for utilization in count-boxes. Lack of uniform russetting is also a problem.</p> |

Virginia Table 1. Yield and size distribution of advanced round white selections - 1985

| Variety ^{1/} | Yield >1 1/2" cwt/A | Usable Yield >1 7/8" cwt/A | % of Superior Yield >1 7/8" | % of Total Yield | | | Internal Defects ^{2/} | |
|---------------------------|---------------------------|-------------------------------------|--------------------------------------|------------------------|-------------------------|---------|-----------------------------------|----|
| | | | | 1 7/8" to 2 1/2" | 2 1/2 " to 3 1/4" | >3 1/4" | HH | HN |
| Atlantic | 311 | 266 | 114 | 12 | 39 | 35 | 1 | 0 |
| Belchip | 303 | 274 | 117 | 7 | 48 | 36 | 0 | 0 |
| LaChipper | 348 | 297 | 127 | 8 | 45 | 32 | 0 | 0 |
| Langlade | 295 | 259 | 111 | 13 | 51 | 24 | 0 | 0 |
| Pungo | 312 | 272 | 116 | 7 | 41 | 40 | 0 | 0 |
| Superior | 262 | 234 | 100 | 11 | 61 | 17 | 1 | 0 |
| B 9192-1 | 284 | 260 | 111 | 7 | 40 | 44 | 0 | 0 |
| B 9528-10 | 243 | 212 | 91 | 9 | 43 | 35 | 0 | 0 |
| B 9581-10 | 310 | 283 | 121 | 6 | 34 | 52 | 0 | 0 |
| B 9792-8 B | 325 | 283 | 121 | 14 | 58 | 15 | 0 | 0 |
| " -16 B | 228 | 183 | 78 | 17 | 54 | 9 | 0 | 0 |
| " -27 B | 299 | 250 | 107 | 13 | 55 | 16 | 0 | 0 |
| " -30 B | 235 | 197 | 84 | 15 | 54 | 13 | 0 | 0 |
| " -53 | 229 | 185 | 79 | 18 | 57 | 5 | 0 | 0 |
| " -54 | 294 | 244 | 104 | 13 | 46 | 24 | 0 | 0 |
| " -61 | 231 | 198 | 85 | 14 | 53 | 18 | 0 | 0 |
| " -79 | 216 | 177 | 76 | 18 | 55 | 8 | 0 | 0 |
| " -158 | 329 | 275 | 118 | 14 | 59 | 11 | 0 | 0 |
| B 9931-22 | 202 | 156 | 67 | 20 | 51 | 7 | 0 | 0 |
| B 9933-27 | 270 | 245 | 105 | 6 | 51 | 34 | 1 | 0 |
| B 9962-9 | 128 | 84 | 36 | 40 | 22 | 0 | 0 | 0 |
| NY 79 | 261 | 228 | 97 | 13 | 42 | 31 | 0 | 0 |
| Duncan-Waller (P >.05) | 30 | 30 | | | | | | |

^{1/} Planted March 14, 1985, on a State sandy loam soil. Harvested July 8, 1985.
 Within row spacing 12 inches.
 Band application of 1000 lbs/A 10-10-10 at planting with 50 lbs N sidedressed.
 Planted in randomized complete block design with 4 replications..

^{2/} Number found per 20 of the largest tubers in the 2 1/4 to 3 1/2" class, cut and examined for internal disorders.

Virginia Table 2. Yield and size distribution of selections with chip potential - 1985.

| Variety ^{1/} | Yield >1 1/2" cwt/A | Usable Yield >1 7/8" cwt/A | % of Superior Yield >1 7/8" | % of Total Yield | | | Internal Defects ^{2/} | |
|-----------------------|---------------------------|-------------------------------------|--------------------------------------|------------------------|------------------------|---------|-----------------------------------|----|
| | | | | 1 7/8" to 2 1/2" | 2 1/2" to 3 1/4" | >3 1/4" | HH | HN |
| Atlantic | 377 | 329 | 112 | 9 | 44 | 35 | 0 | 1 |
| Norchip | 319 | 254 | 86 | 13 | 54 | 13 | 0 | 1 |
| Superior | 326 | 295 | 100 | 8 | 53 | 29 | 0 | 0 |
| B 9423-4 | 387 | 321 | 109 | 10 | 53 | 20 | 0 | 0 |
| B 9792-13B | 321 | 278 | 94 | 8 | 47 | 32 | 0 | 0 |
| " -69 | 327 | 273 | 93 | 14 | 57 | 13 | 0 | 0 |
| " -132 | 299 | 257 | 87 | 10 | 56 | 19 | 0 | 0 |
| " -136 | 339 | 306 | 104 | 7 | 43 | 40 | 0 | 2 |
| " -149 | 297 | 259 | 88 | 11 | 52 | 24 | 0 | 0 |
| " -196 | 293 | 235 | 80 | 18 | 50 | 11 | 0 | 0 |
| B 9955-46 | 373 | 332 | 113 | 9 | 42 | 39 | 0 | 0 |
| B 9956-24 | 242 | 212 | 72 | 11 | 65 | 13 | 0 | 0 |
| B 9962-4 | 140 | 98 | 33 | 26 | 43 | 0 | 0 | 0 |
| M 704-10 | 274 | 216 | 73 | 13 | 50 | 16 | 0 | 0 |
| NC 73C 26-1 | 284 | 226 | 77 | 13 | 54 | 12 | 0 | 0 |
| NC 76C 29-7 | 364 | 319 | 108 | 11 | 59 | 17 | 0 | 0 |
| ND 860-2 | 282 | 208 | 71 | 22 | 51 | 1 | 0 | 0 |
| NY 71 | 313 | 266 | 90 | 13 | 54 | 18 | 0 | 0 |
| NY 74 | 327 | 256 | 87 | 23 | 50 | 5 | 0 | 0 |
| NY 75 | 215 | 187 | 63 | 18 | 58 | 10 | 0 | 0 |
| NY 76 | 368 | 255 | 86 | 21 | 45 | 2 | 0 | 0 |
| NY 81 | 381 | 349 | 118 | 6 | 35 | 51 | 0 | 0 |
| NY 82 | 318 | 259 | 88 | 12 | 53 | 16 | 0 | 0 |
| Duncan-Waller | 39 | 37 | | | | | | |

(P >.05)

^{1/},^{2/}See appropriate footnotes, Table 1.

Virginia Table 3. Yield and size distribution of observational round white selections - 1985

| Variety ^{1/} | Yield >1 1/2" cwt/A | Usable Yield >1 7/8" cwt/A | % of Superior Yield >1 7/8" | % of Total Yield | | | Internal Defects ^{2/} | |
|---------------------------|---------------------------|-------------------------------------|--------------------------------------|------------------------|-------------------------|---------|-----------------------------------|----|
| | | | | 1 7/8" to 2 1/2" | 2 1/2 " to 3 1/4" | >3 1/4" | HH | HN |
| Atlantic | 299 | 267 | 124 | 9 | 42 | 38 | 0 | 1 |
| Superior | 245 | 216 | 100 | 9 | 46 | 33 | 0 | 0 |
| B 9792-97 | 254 | 212 | 98 | 10 | 53 | 21 | 0 | 0 |
| " -113 | 217 | 164 | 76 | 16 | 49 | 10 | 0 | 0 |
| " -157 | 257 | 221 | 102 | 10 | 39 | 37 | 0 | 0 |
| B 9932-46 | 226 | 146 | 68 | 27 | 37 | 0 | 0 | 0 |
| " -51 | 258 | 200 | 93 | 13 | 52 | 12 | 0 | 0 |
| B 9933-2 | 213 | 153 | 71 | 20 | 50 | 1 | 1 | 0 |
| " -25 | 140 | 105 | 49 | 19 | 56 | 0 | 0 | 0 |
| " -29 | 203 | 165 | 76 | 16 | 55 | 11 | 0 | 0 |
| " -36 | 171 | 130 | 60 | 18 | 58 | 0 | 0 | 0 |
| B 9935-3 | 256 | 203 | 94 | 16 | 58 | 5 | 0 | 0 |
| " -14 | 137 | 121 | 56 | 13 | 62 | 13 | 0 | 0 |
| " -25 | 227 | 175 | 81 | 17 | 39 | 20 | 0 | 0 |
| " -26 | 191 | 134 | 62 | 24 | 46 | 0 | 0 | 0 |
| " -28 | 240 | 197 | 91 | 11 | 57 | 14 | 0 | 0 |
| B 9988-10 | 267 | 217 | 100 | 15 | 51 | 15 | 0 | 0 |
| B 0019-2 | 230 | 165 | 76 | 16 | 46 | 9 | 0 | 0 |
| B 0052-36 | 230 | 198 | 92 | 12 | 42 | 32 | 0 | 0 |
| B 0057-9 | 177 | 128 | 59 | 21 | 46 | 6 | 0 | 0 |
| B 0062-101 | 201 | 146 | 68 | 16 | 56 | 0 | 0 | 0 |
| B 0147-18 | 206 | 168 | 78 | 10 | 59 | 13 | 0 | 0 |
| B 0148-1 | 191 | 145 | 67 | 17 | 59 | 0 | 0 | 0 |
| " -13 | 255 | 216 | 100 | 11 | 39 | 35 | 0 | 0 |
| B 0150-1 | 219 | 166 | 77 | 11 | 44 | 20 | 0 | 0 |
| B 0153-5 | 219 | 108 | 50 | 25 | 25 | 0 | 1 | 0 |
| B 0158-15 | 123 | 51 | 24 | 20 | 22 | 0 | 0 | 0 |
| B 0159-5 | 147 | 106 | 49 | 20 | 46 | 6 | 0 | 0 |
| " -22 | 152 | 87 | 40 | 26 | 31 | 0 | 0 | 8 |
| " -27 | 226 | 143 | 66 | 22 | 41 | 0 | 0 | 1 |
| " -32 | 204 | 149 | 69 | 20 | 45 | 8 | 1 | 0 |
| " -49 | 177 | 144 | 67 | 14 | 47 | 20 | 0 | 0 |
| " -93 | 182 | 157 | 73 | 15 | 50 | 22 | 0 | 0 |
| " -105 | 186 | 154 | 71 | 10 | 50 | 23 | 0 | 1 |
| Duncan-Waller (P >.05) | 44 | 46 | | | | | | |

^{1/},^{2/}See appropriate footnotes, Table 1.

Virginia Table 4. Yield and size distribution of advanced russet selections 1985.

| Variety ^{1/} | Yield >1 1/2" cwt/A | Usable Yield >1 7/8" cwt/A | % of BelRus Yield >1 7/8" | % of Total Yield | | | Internal Defects ^{2/} HH HN | |
|-----------------------|---------------------------|-------------------------------------|------------------------------------|------------------------|-------------------------|---------|--|---|
| | | | | 1 7/8" to 2 1/2" | 2 1/2 " to 3 1/4" | >3 1/4" | | |
| Advanced Trial | | | | | | | | |
| BelRus | 233 | 165 | 100 | 26 | 42 | 1 | 1 | 0 |
| Norgold Russet | 282 | 222 | 135 | 13 | 57 | 9 | 0 | 0 |
| Russet Burbank | 257 | 98 | 59 | 23 | 16 | 0 | 0 | 3 |
| Russette | 289 | 231 | 140 | 15 | 55 | 10 | 0 | 0 |
| AF 465-2 | 245 | 158 | 96 | 26 | 38 | 0 | 0 | 0 |
| AF 522-1 | 319 | 227 | 138 | 19 | 49 | 3 | 1 | 0 |
| AF 522-5 | 260 | 208 | 126 | 19 | 58 | 3 | 1 | 1 |
| B 9540-62 | 298 | 263 | 159 | 13 | 53 | 22 | 0 | 0 |
| B 9596-2 | 252 | 196 | 119 | 27 | 46 | 4 | 0 | 0 |
| B 9752-7 | 290 | 210 | 127 | 22 | 45 | 5 | 0 | 0 |
| B 9843-2 | 245 | 193 | 117 | 24 | 49 | 4 | 1 | 0 |
| B 9880-17 | 199 | 133 | 81 | 25 | 29 | 11 | 0 | 0 |
| B 9882-12 | 266 | 189 | 115 | 26 | 45 | 0 | 0 | 0 |
| " -14 | 270 | 232 | 141 | 8 | 52 | 25 | 0 | 0 |
| B 9885-2 | 254 | 182 | 110 | 19 | 43 | 7 | 0 | 1 |
| " -4 | 327 | 236 | 143 | 23 | 45 | 5 | 0 | 1 |
| B 9937-1 | 198 | 155 | 94 | 21 | 56 | 1 | 0 | 0 |
| B 9948-23 | 215 | 150 | 91 | 24 | 41 | 3 | 0 | 0 |
| B 9959-18 | 267 | 139 | 84 | 18 | 35 | 0 | 0 | 0 |
| B 9963-11 | 287 | 209 | 127 | 31 | 41 | 1 | 0 | 0 |
| *B9967-1 | 359 | 315 | 191 | 11 | 60 | 17 | 0 | 0 |
| B 0003-7 | 258 | 186 | 113 | 20 | 47 | 3 | 0 | 0 |
| B 0004-1 | 267 | 205 | 124 | 12 | 46 | 19 | 0 | 0 |
| Waller-Duncan | 39 | 39 | | | | | | |
| P>.05) | | | | | | | | |
| Observational Trial | | | | | | | | |
| BelRus | 159 | 112 | 100 | 29 | 35 | 6 | 0 | 0 |
| Norgold Russet | 218 | 171 | 153 | 12 | 53 | 14 | 0 | 0 |
| B 9735-1 | 306 | 199 | 178 | 11 | 48 | 5 | 0 | 0 |
| B 9738-3 | 197 | 124 | 111 | 14 | 44 | 5 | 0 | 0 |
| " -4 | 207 | 124 | 111 | 22 | 36 | 2 | 4 | 0 |
| B 9744-1 | 200 | 159 | 142 | 20 | 53 | 7 | 0 | 0 |
| B 9882-15 | 222 | 175 | 156 | 15 | 51 | 14 | 0 | 0 |
| " -16 | 161 | 123 | 110 | 19 | 52 | 5 | 0 | 0 |
| B 9940-1 | 243 | 200 | 179 | 11 | 40 | 31 | 0 | 0 |
| B 0060-112 | 253 | 173 | 154 | 21 | 44 | 3 | 0 | 0 |
| Waller-Duncan | 58 | 69 | | | | | | |
| (P>.05) | | | | | | | | |

^{1/},^{2/} See appropriate footnotes, Table 1. Observational trial consisted of 2 replications.

*Long white selection.

Virginia Table 5. Vine and tuber ratings, specific gravity, and chip color for advanced round white study - 1985.

| Entry | Vine Rating | | Tuber Ratings | | | | | Specific Gravity | Chip Color ^{3/} | | | |
|------------|-------------|-------|---------------|------|---------|-----------|-----------|------------------|--------------------------|---|-------|---|
| | Mat. | Poll. | Shape | Size | Appear. | Skin Mat. | Eye Depth | | Days After Harvest | | | |
| | | | | | | | | | 3 | 8 | 14 17 | |
| Atlantic | 7 | 6 | 3 | 4 | 6 | 5 | 5 | 1.098 | 3 | 1 | 4 | 1 |
| Belchip | 5 | 6 | 3 | 5 | 5 | 5 | 7 | 1.084 | 3 | 4 | 3 | 3 |
| LaChipper | 5 | 5 | 3 | 6 | 6 | 6 | 6 | 1.081 | 2 | 5 | 4 | 3 |
| Langlade | 7 | 7 | 4 | 7 | 7 | 5 | 7 | 1.087 | 2 | 4 | 5 | 4 |
| Pungo | 7 | 6 | 3 | 5 | 5 | 6 | 6 | 1.079 | 3 | 4 | 3 | 4 |
| Superior | 6 | 5 | 3 | 5 | 7 | 8 | 6 | 1.079 | 4 | 4 | 4 | 4 |
| B 9192-1 | 5 | 7 | 3 | 7 | 7 | 7 | 5 | 1.076 | 3 | 4 | 2 | 1 |
| B 9528-10 | 4 | 8 | 2 | 7 | 7 | 7 | 6 | 1.081 | 1 | 1 | 1 | 2 |
| B 9581-10 | 6 | 9 | 4 | 7 | 7 | 8 | 4 | 1.081 | 3 | 5 | 3 | 4 |
| B 9792-8B | 8 | 9 | 2 | 5 | 6 | 5 | 7 | 1.107 | 6 | 4 | 3 | 2 |
| B 9792-16B | 4 | 8 | 3 | 5 | 6 | 8 | 8 | 1.088 | 3 | 2 | 3 | 4 |
| B 9792-27B | 5 | 8 | 4 | 5 | 7 | 8 | 6 | 1.086 | 1 | 3 | 4 | 3 |
| B 9792-30B | 5 | 8 | 3 | 6 | 7 | 7 | 7 | 1.084 | 1 | 2 | 2 | 2 |
| B 9792-53 | 5 | 7 | 3 | 5 | 8 | 5 | 8 | 1.098 | 2 | 3 | 3 | 2 |
| B 9792-54 | 5 | 6 | 2 | 5 | 8 | 8 | 4 | 1.081 | 2 | 1 | 2 | 3 |
| B 9792-61 | 3 | 6 | 3 | 6 | 8 | 8 | 6 | 1.082 | 2 | 2 | 2 | 2 |
| B 9792-79 | 4 | 8 | 2 | 5 | 8 | 8 | 7 | 1.087 | 2 | 2 | 2 | 2 |
| B 9792-158 | 5 | 9 | 4 | 6 | 6 | 6 | 8 | 1.086 | 2 | 1 | 2 | 2 |
| B 9931-22 | 1 | 8 | 3 | 5 | 7 | 8 | 5 | 1.091 | 2 | 3 | 2 | 3 |
| B 9933-27 | 6 | 5 | 4 | 7 | 7 | 8 | 7 | 1.084 | 3 | 3 | 3 | 2 |
| B 9962-9 | 4 | 1 | 2 | 5 | 6 | 7 | 8 | 1.071 | 2 | 2 | 4 | 3 |
| NY 79 | 4 | 4 | 2 | 5 | 7 | 6 | 8 | 1.073 | 1 | 2 | 2 | 2 |

^{1/}Vines rated 111 days after planting. Vine maturity: 1 = complete defoliation, 9 = green and succulent. Air pollution: 1 = complete defoliation, 9 = no symptoms.

^{2/}Tubers rated 116 days after planting. Shape: 1 = round, 5 = oblong, 9 = very long (cylindrical). Size: 1 = very small, 9 = very large. Appearance: 1 = very poor, 9 = excellent. Skin maturity: 1 = completely peeled, 9 = no broken skin. Eye depth: 1 = very deep, 9 = very shallow.

^{3/}Chip color of unreplicated samples. 1 - 4 = acceptable, 5 = marginal, 6 or above = unacceptable.

Virginia Table 6. Vine and tuber ratings, specific gravity, and chip color for chip study - 1985

| Entry | Vine Rating 1/ | | Tuber Ratings 2/ | | | | Specific Gravity | Chip Color 3/ | | | | |
|-------------|----------------|-------|------------------|------|---------|-----------|------------------|---------------|--------------------|---|----|----|
| | Mat. | Poll. | Shape | Size | Appear. | Skin Mat. | | Eye Depth | Days After Harvest | | | |
| | | | | | | | | | 3 | 8 | 14 | 17 |
| Atlantic | 6 | 9 | 2 | 8 | 7 | 7 | 5 | 1.090 | 4 | 1 | 5 | 3 |
| Norchip | 7 | 7 | 3 | 4 | 4 | 6 | 7 | 1.087 | 2 | 3 | 3 | 4 |
| Superior | 5 | 9 | 4 | 5 | 6 | 8 | 7 | 1.077 | 2 | 2 | 4 | 5 |
| B 9423-4 | 5 | 9 | 2 | 7 | 7 | 7 | 6 | 1.073 | 1 | 1 | 2 | 2 |
| B 9792-13B | 3 | 5 | 3 | 7 | 4 | 6 | 7 | 1.085 | 2 | 1 | 2 | 1 |
| B 9792-69 | 6 | 9 | 4 | 6 | 4 | 5 | 6 | 1.088 | 2 | 2 | 3 | 3 |
| B 9792-132 | 6 | 7 | 3 | 6 | 5 | 7 | 7 | 1.083 | 2 | 2 | 2 | 1 |
| B 9792-136 | 5 | 9 | 4 | 7 | 5 | 6 | 7 | 1.079 | 2 | 1 | 2 | 3 |
| B 9792-149 | 6 | 9 | 2 | 6 | 6 | 5 | 6 | 1.086 | 3 | 2 | 5 | 2 |
| B 9792-196 | 3 | 9 | 4 | 5 | 4 | 7 | 7 | 1.089 | 2 | 2 | 4 | 2 |
| B 9955-46 | 5 | 9 | 3 | 7 | 7 | 6 | 7 | 1.075 | 3 | 3 | 5 | 3 |
| B 9956-24 | 3 | - | 3 | 6 | 6 | 8 | 6 | 1.071 | 2 | 1 | 3 | 2 |
| B 9962-4 | 1 | - | 2 | 4 | 7 | 8 | 8 | 1.071 | 2 | 2 | 2 | 2 |
| M 704-10 | 3 | 8 | 3 | 5 | 6 | 7 | 7 | 1.082 | 2 | 3 | 5 | 3 |
| NC 73C-26-1 | 4 | 7 | 4 | 6 | 5 | 8 | 8 | 1.081 | 3 | 5 | 4 | 3 |
| NC 76C-29-7 | 6 | 9 | 3 | 6 | 5 | 8 | 7 | 1.076 | 3 | 1 | 3 | 4 |
| ND 860-2 | 1 | - | 2 | 3 | 6 | 8 | 8 | 1.073 | 1 | 1 | 2 | 1 |
| NY 71 | 4 | 6 | 3 | 5 | 7 | 8 | 8 | 1.073 | 1 | 3 | 3 | 2 |
| NY 74 | 5 | 9 | 3 | 6 | 5 | 7 | 8 | 1.088 | 2 | 1 | 3 | 2 |
| NY 75 | 6 | 8 | 3 | 5 | 6 | 8 | 7 | 1.089 | 1 | 1 | 2 | 2 |
| NY 76 | 5 | 9 | 2 | 5 | 8 | 7 | 8 | 1.072 | 2 | 2 | 3 | 1 |
| NY 81 | 6 | 9 | 3 | 8 | 8 | 7 | 7 | 1.081 | 5 | 5 | 6 | 6 |
| NY 82 | 4 | 7 | 2 | 6 | 5 | 7 | 5 | 1.073 | 1 | 1 | 2 | 1 |

1/, 2/, 3/ See footnotes Table 5.

Virginia Table 7. Vine and tuber ratings, specific gravity, and tuber defects for advanced russet study -1985.

| Entry | 1/ Vine Ratings | | | 2/ Tuber Ratings | | | | 3/ Tuber Defects | | |
|----------------|--------------------|-------|-------|---------------------|------|------|-------|---------------------|------|-------------|
| | Mat. | Poll. | Shape | Size | App. | Mat. | Text. | S. G. | burn | 2nd Gr. Cr. |
| BelRus | 6 | 7 | 8 | 4 | 7 | 7 | 2 | 1.088 | 9 | 6 9 |
| Norgold Russet | 4 | 5 | 5 | 5 | 5 | 6 | 3 | 1.068 | 9 | 6 9 |
| Rus. Burbank | 8 | 7 | 6 | 4 | 4 | 4 | 3 | 1.080 | 9 | 2 2 |
| Russette | 7 | 8 | 6 | 5 | 5 | 5 | 2 | 1.090 | 5 | 9 4 |
| AF 465-2 | 4 | 7 | 6 | 4 | 4 | 6 | 3 | 1.081 | 4 | 9 7 |
| AF 522-1 | 5 | 8 | 6 | 5 | 4 | 5 | 1 | - | 5 | 7 6 |
| AF-522-5 | 4 | 6 | 6 | 5 | 6 | 6 | 2 | 1.094 | 9 | 9 9 |
| B 9540-62 | 6 | 7 | 8 | 7 | 7 | 7 | 2 | 1.082 | 9 | 9 9 |
| B 9596-2 | 4 | 8 | 8 | 6 | 7 | 8 | 2 | 1.068 | 9 | 9 9 |
| B 9752-7 | 3 | 8 | 7 | 4 | 5 | 7 | 2 | 1.073 | 6 | 6 9 |
| B 9843-2 | 5 | 8 | 7 | 5 | 5 | 6 | 2 | 1.075 | 9 | 9 9 |
| B 9880-17 | 1 | 8 | 7 | 4 | 6 | 7 | 3 | 1.071 | 9 | 9 4 |
| B 9882-12 | 3 | 7 | 8 | 5 | 6 | 8 | 2 | 1.077 | 9 | 4 9 |
| B 9882-14 | 4 | 6 | 7 | 5 | 5 | 6 | 2 | 1.073 | 9 | 9 9 |
| B 9885-2 | 4 | 7 | 7 | 6 | 6 | 5 | 2 | 1.076 | 7 | 7 4 |
| B 9885-4 | 5 | 6 | 6 | 5 | 5 | 6 | 3 | 1.071 | 9 | 5 9 |
| B 9937-1 | 2 | 7 | 5 | 5 | 3 | 8 | 3 | 1.076 | 9 | 9 7 |
| B 9948-23 | 1 | - | 6 | 4 | 5 | 7 | 1 | 1.070 | 9 | 7 7 |
| B 9959-18 | 4 | 8 | 6 | 5 | 4 | 5 | 3 | 1.074 | 9 | 4 4 |
| B 9963-11 | 6 | 8 | 7 | 6 | 7 | 6 | 2 | 1.081 | 7 | 9 4 |
| B 9967-1 | 4 | 8 | 5 | 7 | 5 | 5 | 8 | 1.085 | 9 | 7 9 |
| B 003-7 | 2 | 7 | 6 | 5 | 5 | 8 | 2 | 1.076 | 9 | 9 4 |
| B 0044-1 | 4 | 6 | 6 | 6 | 6 | 8 | 1 | 1.080 | 9 | 6 2 |

1/, 2/, see Table 5.

3/Tuber defects: 9 = minimal, 1 = severe.

Virginia Table 8. Vine and tuber ratings, and specific gravity for observational round white study - 1985.

| Entry | Vine ratings ^{1/} | | Tuber ratings ^{2/} | | | | | Specific Gravity | Comments |
|------------|----------------------------|-------|-----------------------------|------|---------|------|-----------|------------------|---------------------------------|
| | Mat. | Poll. | Shape | Size | Appear. | Mat. | Eye Depth | | |
| Atlantic | 6 | 9 | 2 | 6 | 5 | 7 | 6 | 1.101 | |
| Superior | 5 | 9 | 3 | 6 | 6 | 7 | 5 | 1.079 | |
| B 9792-97 | 3 | 7 | 3 | 6 | 6 | - | 6 | 1.085 | Rough, large set. |
| B 9792-113 | 4 | 8 | 3 | 5 | 5 | - | 7 | 1.087 | Variable, second growth. |
| B 9792-157 | 6 | 8 | 3 | 6 | 6 | 7 | 4 | 1.084 | |
| B 9932-46 | 2 | 6 | 4 | 4 | 5 | - | 7 | 1.074 | Nice, some soft rot. |
| B 9932-51 | 4 | 7 | 4 | 6 | 6 | 7 | 7 | 1.079 | Smooth, sunburn. |
| B 9933-2 | 5 | 8 | 4 | 5 | 4 | - | 8 | 1.094 | |
| B 9933-36 | 3 | 5 | 4 | 5 | 4 | 6 | 6 | 1.091 | Large set, sunburn. |
| B 9935-3 | 3 | 6 | 4 | 5 | 4 | - | 6 | 1.084 | |
| B 9935-25 | 6 | 8 | 3 | 6 | 4 | 7 | 8 | 1.085 | |
| B 9935-26 | 4 | 9 | 3 | 4 | 4 | 8 | 8 | 1.086 | Scab, slightly irregular. |
| B 9988-10 | 4 | 7 | 2 | 5 | 5 | 7 | 8 | 1.080 | Nice. |
| B 0019-2 | 5 | 9 | 7 | 5 | 5 | 5 | 7 | 1.080 | Irregular, russet. |
| B 0052-36 | 5 | 7 | 3 | 6 | 4 | 6 | 8 | 1.070 | Rough, some soft rot. |
| B 0057-9 | 1 | 4 | 2 | 3 | 5 | 7 | 8 | 1.072 | |
| B 0062-101 | 1 | 6 | 2 | 4 | 7 | 7 | 7 | 1.070 | Nice, small, sunburn. |
| B 0147-18 | 4 | 8 | 4 | 5 | 5 | 6 | 7 | 1.077 | Good set, sunburn. |
| B 0148-1 | 6 | 6 | 3 | 4 | 5 | 7 | 7 | 1.072 | Nice. |
| B 0148-13 | 2 | 4 | 3 | 7 | 4 | 8 | 7 | 1.068 | Rough, good set, sunburn. |
| B 0159-22 | 4 | 8 | 2 | 5 | 7 | 6 | 7 | 1.080 | Nice, uniform, small. |
| B 0159-27 | 4 | 7 | 2 | 5 | 7 | 6 | 7 | 1.094 | Nice. |
| B 0161-32 | 3 | 8 | 3 | 6 | 6 | 8 | 8 | 1.092 | Pink eyes, sunburn. |
| B 0161-49 | 2 | 7 | 3 | 6 | 6 | 7 | 4 | 1.081 | Pink eyes, flat, growth cracks. |
| B 0161-93 | 3 | 7 | 3 | 6 | 6 | 8 | 8 | 1.091 | Pink eyes, nice. |
| B 0161-105 | 4 | 7 | 3 | 7 | 7 | 6 | 7 | 1.087 | Nice. |

^{1/}, ^{2/} see Table 5.

WISCONSIN

R. E. Hanneman, Jr.

Genetics and Cytogenetics of the Tuber-bearing Solanum Species (Cooperative USDA, ARS and Wisconsin Experiment Station)

Reciprocal Cross
Differences and
the Advancement of
Germplasm in
Bulk Populations
Utilizing Recurrent
Selection.

Large reciprocal differences were reported by Sanford when a mixed population of Group Phureja and Gp. Stenotomum was reciprocally crossed with a population of Gp. Tuberosum haploids. In the progeny, reciprocal differences were observed for tuber initiation, tuber set, vine senescence, tuber yield, flowering, and male fertility. These differences were large in the F₁ generation, but were less dramatic when the populations were inter-mated to form F₂ generations. This study has been continued for two more cycles.

The four populations advanced through four cycles of intermating and selection are: Tuberosum haploid (HH), Phureja/Stenotomum (PP), Tuberosum haploid x Phureja/Stenotomum (HP) and its reciprocal, Phureja/Stenotomum x Tuberosum haploid (PH). Two other hybrid populations were also included in this study and they were the reciprocal populations derived from hybridizing the two most advanced parental source populations (HH and PP). These two populations are Tuberosum haploid (HH) x Phureja/Stenotomum (PP) designated HHPP and its reciprocal designated PPHH.

In this study again statistically significant reciprocal differences (HP vs PH) in the 1st two cycles of selection were observed for flowering and pollen shed at both locations; for maturity and yield for one of the first two cycles at Hancock, and for the second cycle for maturity at Sturgeon Bay. No significant differences were observed for flowering or pollen shed in the last two cycles, nor for maturity except for cycle 3 at Sturgeon Bay. Statistical significance for yield was noted in cycles 3 and 4 at Sturgeon Bay, but not at Hancock. In contrast to the first two cycles, the PH population yielded more than the HP population.

The HHPP and PPHH populations did not differ significantly from each other for flowering at either location, but pollen shed and maturity were significant at Sturgeon Bay, while yield was significant at Hancock. When compared to the HP and PH populations respectively, no significant difference was observed for flowering, but a significant difference was observed for pollen shed for PH vs. PPHH at Sturgeon Bay and for both HP vs. HHPP and PH vs. PPHH for maturity at Sturgeon Bay. Yield was significant at both locations except for HP vs. HHPP at Hancock.

Compared to the first two cycles of selection in this study, where strong reciprocal differences were observed with a centralizing tendency, it seems that these significant differences disappeared in the 3rd and 4th cycles for the traits observed. The behavior of yield in the later cycles is puzzling since the PH population overtook the HP population. This may have been due to a differential selection pressure which was used with HH and HP populations where the upper half of the population was kept for intermating based upon the yield of single hills, in contrast to keeping the upper quarter of the PP and PH populations. This difference in selection was done to compensate for a lack of flowering or male fertility in the HH and HP populations. It is also to be noted that the PP population increased its yield markedly over four cycles of selection in comparison to the HH population.

The hybrid populations HHPP and PPHH were outyielded by one or both of the selected hybrid populations (HP and PH), indicating that while heterosis was expressed in one case (yield greater than the mid-parent), it was not significant in comparison to the yield of selected populations (HP or PH).

Several points can be made in conclusion. It appears that reciprocal differences do exist in early generations when parents of widely differing maturity are used and that they do parallel the maternal parent. Secondly, these differences disappear with future cycles of selection. Thirdly, F_1 heterosis is not a major factor to be considered in the development of such individual parent populations to be combined later, and thus population improvement can concentrate on the initial Tuberosum-species populations. Fourthly, that significant gain for yield can be made in the original source populations and that the differential rate of gain could be due to differential selection pressure for yield which was applied to the population indicating that progress can be made for yield based on selection of high yielding seedlings.

Regeneration of Plants from Microspores via Anther Culture.

In total, 31 plantlets have been regenerated from 3,183 anthers cultured from 30 different PIs of four 4x Mexican species in the summer of 1984. The ploidies of these plants have been confirmed. The three media used to screen the culturability of different genotypes were Wenzel (W), Modified Wenzel (MW), and Nitsch and Nitsch (NN). The two media, MW and NN, provided better performance compared to the W media. Results showed that plantlets regenerated directly from microspores, by-passing the callus cycle, were more likely to be haploids than those regenerated via the callus cycle. Four plantlets, two each from Solanum stoloniferum and S. fendleri, were haploids and the remaining 26 were tetraploids and mixaploids. The possible origin of the tetraploid plants is under investigation.

In general haploid plants appeared smaller and weaker for most morphological characters. Even though there was a

drastic reduction in fertility, their vegetative vigor was good. Stainable pollen ranged from 10-16 percent for both haploids, but was comparatively higher for S. stoloniferum haploids. S. stoloniferum haploids could also be distinguished from S. fendleri haploids in that the former had a robust flowering habit with a considerably longer flowering period (duration) compared to the latter.

Preliminary cytogenetics evaluation of the haploids revealed a higher pairing frequency compared to earlier reports. Most of the stainable pollen measured was the size of 2n pollen. A number of trinucleate cells were observed which could have been the leading mechanism for 2n pollen formation via tripolar configuration. Abnormal chromosome division is a common phenomena in many cells, varying from lagging chromosomes to micronuclei. Further studies are underway.

Crossing the haploid plants as female and male parents with 1 and 2 EBN series testers has been unsuccessful. In all, 2,768 pollinations, 1,927 pollinations using haploids as female and 841 pollinations using haploids as male parent were done without a single seed formed. Several small fruits were often observed but without seeds.

These haploids tuberized fairly well producing 0-20 (approx.) tiny tubers per potted plant. Attempts are underway to take the plants through one tuber cycle to eliminate the presence of any carry-over hormonal effects from the culture systems.

The anther-derived tetraploid plants are being screened for possible somaclonal variation and their crossability with 1, 2 and 4 EBN series testers. Their mode of origin such as 2n pollen, spontaneously double-haploid, or maternal tissue is being investigated. The recovery of male sterility and its inheritance is also being investigated.

Similar experiments were repeated this summer (1985) mainly to test the consistency of success of the two media, MW and NN, and to regenerate more haploid plants, especially from those unsuccessful species. Approximately, 30 plantlets have so far been obtained from the 1985 summer culture from five different PIs and one inter-specific hybrid between S. fendleri x S. stoloniferum. The findings so far indicate the repeatability of the experiment with fairly consistent results with the two media MW and NN. Several generalizations can be made from the two experiments: The two media, MW and NN, are fairly consistent in regenerating plants from Mexican tetraploid species. The culturability of the different genotypes in the two media is variable not only between species but between PIs within a species. The response of S. stoloniferum and S. fendleri to the two media, MW and NN is consistent for both experiments. S. fendleri, PI 275158, consistently responded better to the culture systems as a species as well as in the inter-specific hybrid with S. stoloniferum.

**Chloroplast Genomic
Variation in
Solanum tuberosum
ssp. andigena.**

Cytoplasm is different between S. tuberosum ssp. andigena (Andigena) and ssp. tuberosum (Tuberosum). Andigena has the A or S type chloroplast genome (ct-genome), while Tuberosum has the T type ct-genome. Any wild species having a T type ct-genome, which is presumed to have been an ancestral female parent of Tuberosum, has not been identified so far. Additionally, two wild species, S. sucrense and S. oplocense (6x cytotype), were analyzed, but they do not have T type ct-genome.

The first expectation would be that Tuberosum type ct-genome exists in some variants of Andigena. Thus, several Andigenas from different countries were used and their ct-genome types were identified. For the rapid determination, the ct-genome type was based on only Bam HI digestion pattern of each chloroplast DNA.

As a result, Andigenas from the north and south ends of Andes have the common A type ct-genome, whereas some of them from the central Andes have the S type ct-genome, the Andigena of which ct-genome type is thought to have differentiated in more recent times than that of the A type ct-genome. One of the Argentine Andigenas has a W type ct-genome. It is questionable whether this Andigena is of hybrid origin with wild species, or is the most primitive type of Andigena. A more detailed survey is needed for Argentine Andigenas as well as those of Bolivian origin.

**Modified monosporic
Megaspороgenesis in
Solanum commersonii.**

Previous studies in Solanum have observed the Polygonum type of megaspороgenesis, in which a linear tetrad of megaspores is formed. The three micropylar megaspores then degenerate, leaving the chalazal megaspore to divide mitotically to form the egg sac. Megaspороgenesis was studied in intact ovules of Solanum commersonii after staining with Mayer's hemalum and clearing with methyl salicylate or cedarwood oil.

Contrary to expectation, only 30 percent of the observed sporads within the same ovary were tetrads, with triads being the predominant form. Many dyads, with one deteriorating cell, could also be observed, as were triads with one deteriorating megaspore at the micropylar end. These observations can be explained if the micropylar daughter cell formed after meiosis I began deteriorating before the second meiotic division. The chalazal daughter cell would still undergo the second meiotic division, followed by death of the new micropylar megaspore.

The possibility that triad formation may be associated with 2n megaspore formation has not been definitely excluded. Diploid-tetraploid crosses will be performed to further evaluate this point. At this time, however, the different nuclear and nucleolar sizes associated with n and 2n cells have not been observed. Furthermore, an SDR phenomenon would

not explain the two-cell stages with one deteriorating cell, or the triads with a prematurely deteriorating micropylar megaspore.

Studies on the
Involvement of a
GA-related Dwarfing
Locus in Tuberosum-
Andigena Reciprocal
Yield Differences.

Large yield differences have been reported in certain exact Tuberosum-Andigena hybrid families. These differences have been found to be dependent on selection of parents at opposite extremes for photoperiod reaction. Since GA affects maturity and tuberization, it has been suggested that the GA status of the plants involved is also significant. The most obvious possible causes of these differences are: 1) cytoplasm, 2) gene-cytoplasm interaction, 3) gametophytic or other inadvertent selection, and 4) maternal effects. The cultivar "Superior" and an Andigena clone coded 11.1 produce a particularly large and consistent reciprocal yield difference, and were both found to be heterozygous at a GA-related dwarfing locus. Various observations implicated a non-random distribution of this gene in the reciprocal difference phenomenon: 1) "dwarf" seeds do not sprout without GA treatment, 2) dwarfs occur as about 1 percent of Superior x 11.1 seedlings but are absent in the reciprocal family, 3) dwarfs tuberize earlier with greater tuber set than their normal or GA-restored sibs, and 4) GA applied at pollination in the cross Superior x 11.1 results in a family which mimics the reciprocal family's yield distribution and dwarf frequency.

Crosses were made to obtain dwarf frequency testcross data for 72 Superior x 11.1 and 72 11.1 x Superior clones. A family of 108 testcross seedlings from each clone was observed to determine parental genotype. The yield of each parental clone was also measured. A difference in gene frequency between reciprocal families would indicate gametophytic selection. In conjunction with a correlation between dwarf-locus genotype and yield, this would explain the yield difference between reciprocal families. If the relationship between yield and dwarf-locus genotype was cytoplasm dependent, a gene-cytoplasmic interaction would be indicated.

No evidence could be found for a reciprocal difference in the distribution of simplex, duplex, and triplex genotypes. Thus the gametophytic selection expected for this gene was not detected. Average per-hill yield for each genotype was calculated for both cytoplasms. While all genotypes had similar yields in Tuberosum cytoplasm, simplex clones in Andigena cytoplasm yielded considerably more than their triplex sibs, especially in 1984 when the reciprocal difference was highest. These data suggest that the reciprocal yield difference attributable to the dwarf-locus is due to a gene-cytoplasmic interaction.

Rapid Ploidy
Screening Through
Pollen Diameter
Measurements.

Performing chromosome counts on many individual plants requires skill and considerable time. While this is the only method by which ploidy can be unequivocally established, a fast and reliable screening technique would have numerous

applications. It has long been noted that the 2n pollen in a pollen sample can be identified microscopically by their relatively large diameters compared to n pollen. This study was undertaken to determine if pollen ploidy is sufficiently correlated to pollen volume (and therefore diameter) to make pollen measurement a reliable method of ploidy screening.

Pollen from plants of various Solanum species and ploidies was collected and stained by the usual method used in aceto-carmin pollen stainability tests. An optical micrometer with divisions representing 0.01 mm at medium power was used to measure diameters. Bulk pollen of known ploidy was observed to determine the normal range of diameters for pollen of 2x, 4x, and 6x parents. Most observations fit well with theoretical expectations based on a linear relationship between ploidy and pollen volume.

Seventy-three pollen samples representing 44 species and including 1x, 2x, 3x, 4x, 6x, 8x, and 12x pollen were collected, coded, measured (30 grains per sample), and assigned predicted ploidies. Sixty-five of these samples were predicted correctly. Of the eight mistakes, four were due to confusing 4x and 6x parents. The remaining mistakes were due to unusually large lycopersicoides, jamesii, and gourlayi pollen; unusually small stoloniferum pollen. Large, dark stained grains free of starch granules appear to best fit theoretical expectations for pollen of 6x and 4x parents.

This technique would be particularly useful and accurate when screening for haploids or colchicine doubled clones, since one would be distinguishing two ploidy levels, one double the other, e.g. 2x vs. 4x.

An Assessment of the Usefulness of Hermetic Sealing for Preserving Germinability of Solanum Seed.

This experiment was initiated in 1963 to compare the survival characteristics of Solanum seedlots sealed in metalized polyester packets versus those stored in paper seed envelopes.

The 24 seedlots tested were intercultivar hybrids and advanced interspecific selections x Katahdin. Half of each sample was stored in sealed metalized polyester pouches inside paper seed envelopes, the other half in paper envelopes alone. All seeds tested were produced in June 1963, and maintained continuously in a refrigerator at approximately 1° C. Germination for each seedlot was assessed by placing 50 seeds on moistened filter paper in a 10 cm petri dish, and recording the percent seeds sprouted up to one month post hydration. Percent germination was tested after two years (1965), six years (1969), ten years (1973), and 22 years (1985) of storage.

After two, six and ten years, most seedlots retained near 100 percent germination whether sealed or unsealed. Between 10 and 22 years, percent germination dropped sharply in all seedlots. In most cases, however, the percent germination after 22 years of storage was much greater for sealed seeds

In this study the benefits of sealing were obvious only after long-term storage. The use of other types of seeds or unfavorable seed storage conditions, however, could make metalized polyester sealing advisable for short-term storage as well.

